

11/11 1943
1-5 1-1-1-1 Army
WAR DEPARTMENT TECHNICAL MANUAL

TM 5-3000

**Tractor, Wheeled, Rubber-Tired,
Gasoline, 30 DBHP, Rigid,
Case Model "DI"**

Contract W-1088-eng. (MSP) 2725

Contract W-47-013-eng. (MSP) - 63

Contract W-47-013-eng. (MSP) - 44



MAINTENANCE INSTRUCTIONS AND PARTS CATALOG

WAR DEPARTMENT - October 1943

TM 5-3000

WAR DEPARTMENT

Washington 25, D. C., (Oct. 1943)

**TM5 - 3000, Maintenance Instructions and
Parts Catalog Covering Tractor, Wheeled,
Rubber-Tired, Gasoline, 30 DBHP, Rigid, Case
Model "D1" on Contract W-1088-eng-(MSP) 2725
Contract W-47-013-eng.(MSP)-63
Contract W-47-013-eng.(MSP)-44**

**is published for information and guidance of all
concerned.**

(AG 300.7 (18 June 1943)

(By Order of the Secretary of War.)

**G. C. MARSHALL,
CHIEF OF STAFF.**

Official:

J. A. ULIO,

Major General,

The Adjutant General.

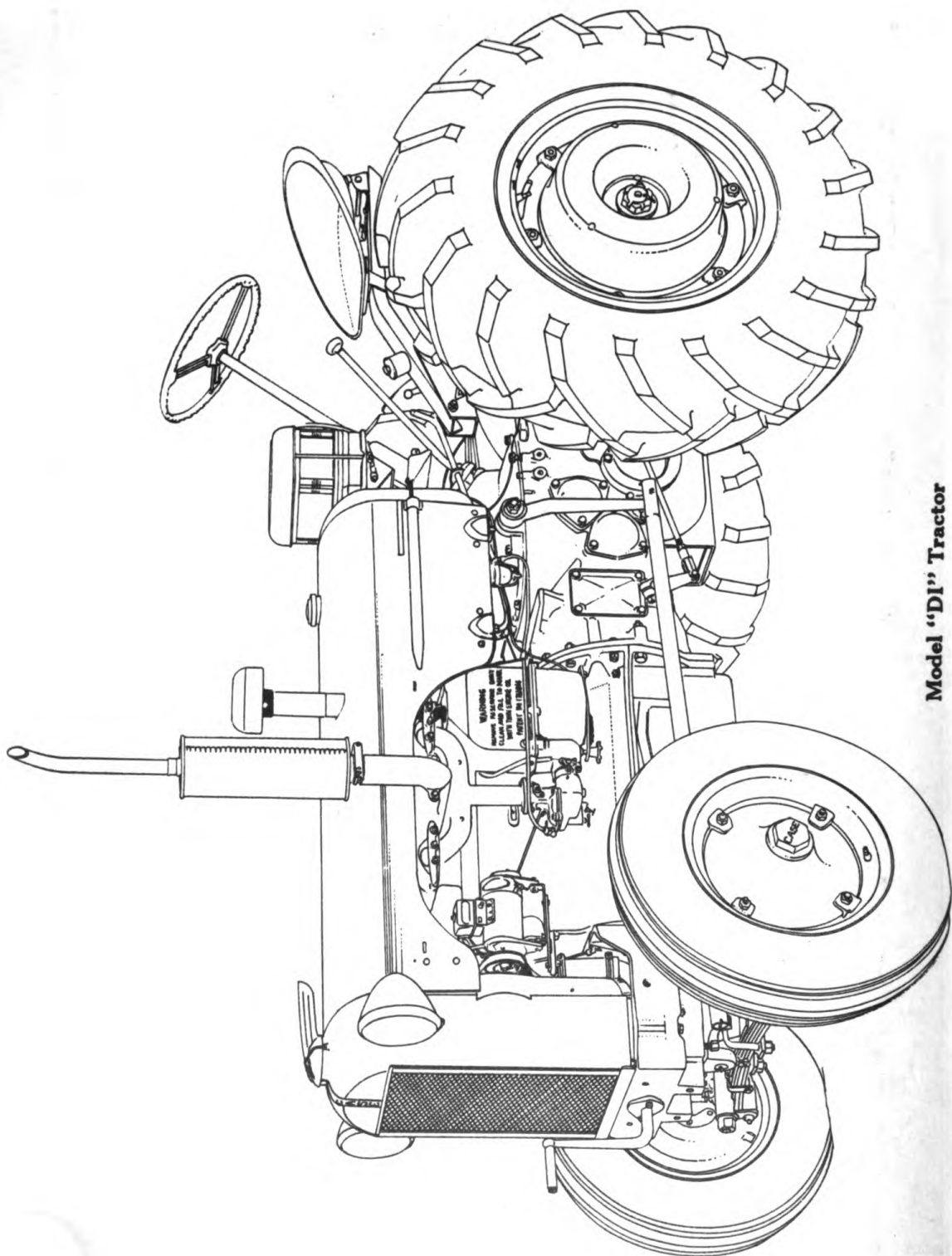
Combined
**OPERATOR'S INSTRUCTIONS
MAINTENANCE INSTRUCTIONS**
and
PARTS CATALOG
for
TRACTOR
Model "DI"
Manufactured For
CORPS OF ENGINEERS

by
**J. I. CASE COMPANY
RACINE - - WISCONSIN**

This Book Covers:

**War Department Contract W1088-Eng. (MSP)-2725
Contract W-47-013-Eng. (MSP)-63
Contract W-47-013-Eng. (MSP)-44**

**Serial Numbers -
4707577 and up**



Model "D1" Tractor

Operating and Maintenance Instructions Case Model "DI" Tractor

Table of Contents

	Page No.
Air Cleaner.....	17
Axle, Rear—Bearing Adjustment.....	71
Battery Storage	90
Brakes.....	75, 76
Carburetor.....	33
Chains, Drive.....	74
Clutch, Pedal Movement.....	59
Clutch, Installing.....	62
Clutch—Removing.....	60
Clutch Brake.....	76
Cooling System.....	55
Cooling System, Cleaning the.....	55
Connecting Rods.....	42
Crankcase Capacity.....	4
Cylinder Barrels.....	48
Differential Assembly.....	70
Drag Link Adjustment.....	78
Electrical Equipment.....	89
Engine.....	36, 37
Engine Oil Recommendations.....	14
Engine, Removing from Tractor.....	38
Engine, Starting.....	9
Engine, Stopping.....	12
Fan Belt, Installing New.....	54
Fuel Filter.....	29
Generator.....	89
Governor.....	21
King Pins.....	58
Lubrication Instructions.....	14
Magneto, Field Servicing.....	94
Magneto, Timing.....	92
Maintenance Instructions.....	19
Oil Pressure.....	24
Oil Pump.....	27
Oil Pump and Screen.....	24
Operating Instructions.....	11
Operation, Cold Weather.....	30
Operators Maintenance.....	19
Operator, Suggestions to the.....	5
Piston Pins.....	47
Piston and Rings.....	50
Power Take-Off.....	79
Power Take-Off, Installation.....	81
Radiator, Care of for Winter Operation.....	55
Radiator, Removing.....	57
Rubber Tires.....	10, 83
Safety Rules.....	5

Table of Contents

Continued

	Page No.
Service Suggestions.....	19, 20
Shaft, Belt Pulley and Brake.....	69
Shaft, Sliding Gear or Second Reduction.....	68
Spark Plugs.....	54
Specifications.....	4
Spiral Bevel Gears, Adjustment of.....	65
Starting and Lighting Equipment.....	89
Steering.....	77
Steering Gear Adjustment.....	77
Storage.....	106
Tire Pump.....	82
Tires, Pneumatic.....	10, 83
Tractor, New, Preparing for Use.....	6
Tractor, Driving.....	10
Tractor, Stopping.....	12
Transmission and Differential.....	14
Transmission Oil Recommendations.....	14
Valves, Adjusting Clearance.....	44, 45
Valve Seats, Reconditioning.....	45
Valves and Valve Seats.....	44, 45
Water Pump, Servicing.....	50
Wheel Bearings, Front.....	58

List of Illustrations

Case Model "DI" Tractor

Fig. No. Page No.

Air Cleaner.....	5	17
Axle and Spindle (Front).....	41	78
Axle, Rear.....	35	71
Brake, Foot.....	38	75
Carburetor.....	12	34
Chains, Adjusting Drive.....	37	74
Clutch, Foot Operated.....	25	59
Clutch Brake and Hand Brake.....	39	76
Connecting Rod Bearings.....	17	42
Cylinder Barrels, Pulling.....	20	48
Differential Shaft.....	34	70
Electrical System, Details of.....	44	87
Engine Crankshaft, Connecting Rods and Pistons, Details of...	16	39
Engine, End View.....	14	36
Engine, Side View.....	15	37
Fan.....	21	51
Fan Details.....	22	53
Filter—Oil.....	10	28
Gear Shift Diagram.....		10
Governor and Magneto Assembly.....	6	21
Governor.....	7	22
Lubrication Diagram.....	4	13
Magneto Details.....	46 to 56	93 to 101
Magneto, Small Tools Required to Service.....	57	103
Manifold and Air Cleaner.....	11	31
Oil Pump Assembly.....	8, 9	25, 26
Operating Controls.....	3	11
Pinion—Clutch.....	29	65
Power Take-Off, Details of.....	42	80
Puller—Bearing.....	36	72
Removing Radiator.....	23	57
Shaft, Sliding Gear.....	32	68
Shaft, Belt Pulley and Brake.....	33	69
Spiral Gears.....	31	67
Spiral Gears, Adjusting.....	30	66
Steering Gear Adjustment.....	40	77
Strainer, Fuel.....	13	35
Tires, Filling.....	43	83
Tools, Service (Owatonna).....	58	104
Tractor, Case Model "DI"—Left Side.....	1	8
Tractor, Case Model "DI"—Right Side.....	2	9
Tractor, Left Side Ready for Splitting.....	27	63
Tractor, Right Side Ready for Splitting.....	26	61
Tractor Split, Clutch Removed.....	28	64
Valve Clearance, Adjusting.....	18	44
Valve, Removing.....	19	45
Water Pump.....	21	51
Water Pump Details.....	22	53
Wheel Bearing, Adjusting Front.....	24	58
Wiring Diagram.....	45	89

66113
.2
TMS:
3000
1941
★ ★

SPECIFICATIONS

MODEL "DI" TRACTOR

Capacities

Fuel Tank: 19¼ U. S. gals.	16. Imp. gal.	82.9 liters
Cooling System: 6½ U. S. gals.	5.4 Imp. gal.	24.6 liters
Engine Crankcase: 7 qts.	1.5 Imp. gal.	6.6 liters
Transmission and Differential: 10 U. S. gals., 8.3 Imp. gal., 37.8 liters		

Engine

Cylinder—4
Bore—3⅞"
Stroke—5½"
Displacement—259.5 cubic in.
Compression Ratio—4.86 to 1
Compression Pressure—96 lbs.
Full load speed—1200 R. P. M.
No load speed—1367 R. P. M.
Spark Plug—No. 85—18 MM.
Spark plug gap—.028" to .032"
Valve adjustment—.018"
Carburetor—"Zenith" Model 62-AXJ9
Magneto—"Case" Type JMA
Oil Filter—"Purolator"
Air Cleaner—"Case"
Governor—"Case".

Clutch

Foot operated—Rockford 12TT

Brakes

Foot operated, Shoe type, Internal expanding
Hand brake on sliding gear shaft.

Power Take-Off

Speed (at loaded engine speed)—540 R. P. M.
Height above ground—27½ on 12.00-24 tires—21.6 L. R.
Located at center line of draw bar—Center

GENERAL DIMENSIONS (tractor only without equipment)

Overall length—110"
Overall width—63⅞"
Height to top of hood—51¼"
Height to top of steering wheel—66"
Height to top of exhaust—77⅜"
Wheel Base—66⅝"
Turning radius—R. H.—13' 9"—L. H. 14' 5"
Drawbar height—12¼" to 17"
Weight with oil, water and gasoline—5393 lbs.
Weight without oil, water and gasoline—5217 lbs.

Other Special Items:

Hour Meter—Purchased from John W. Hobbs Co., Springfield, Illinois
No. 3 Master Padlock (Type 1C) for locking tool box—Purchased from
Master Lock Co., Milwaukee, Wisconsin

Part 1

Operation and Adjustment Of Your Model "DI" Tractor

SAFETY INSTRUCTIONS

For your safety, and to prevent damage to the tractor the following rules should be observed:

1. Never make a short turn at high speed—above 5 miles per hour. Brakes for turning should be used only at low speeds.
2. Particular caution must be exercised while working on hill sides or rough ground.
3. Never get on or off a tractor while it is in motion.
4. Engage the clutch gradually when starting the tractor, so that the load will be picked up slowly. This is particularly true when the tractor is going up a steep hill or climbing out of a bog or ditch, or when hitched to a heavy load. While working under such conditions, the operator must be prepared to disengage the clutch at once, should the front wheels raise off the ground.
5. The power take-off should never be operated without the standard guard furnished with the tractor, or without the power take-off telescoping shields to cover the revolving shaft from tractor to driven machine. Should a power take-off driven machine be delivered without the telescoping shields, contact the factory immediately providing it is of CASE manufacture. If the machine is other than a CASE, see their nearest representative.
6. When hand cranking an engine, the handle should be pulled upward and across the engine with the left hand so the operator's hand will be in a position to avoid being struck by the starting crank if there should be a reversal of direction of crankshaft rotation.
7. **Read This Instruction Book Carefully.**

OPERATOR'S INSTRUCTIONS

PREPARING A TRACTOR FOR USE

INSPECTION

1. It is the desire of the J. I. Case Co. that each tractor delivered should be not only mechanically perfect, but as clean in appearance as it was the day it left the factory. Whenever possible, box cars will be used in making shipments and at times this requires the removal of some parts from the tractor to save space in loading. Replace these parts, using lock washers on all bolts.
2. Inspect tractor carefully, making sure that nothing has become loose, damaged or broken in shipment. Remove cinders, dirt or paint from moving parts where these may cause the parts to bind.
3. Be sure that air vent hole in cap of fuel tank is open.
4. Work the clutch pedal to see that it does not stick and that shoe does not bind on brake sleeve. See that both brake and clutch engage properly.

LUBRICATION

Check over lubrication of entire tractor according to lubrication chart, Fig. 4 Page 13, and lubrication instructions on pages 14 and 15.

Tractors are shipped from the factory without oil in the crankcase. Before a new engine is started in warm weather, seven quarts of a good grade of oil having a viscosity of O E SAE No. 10 should be put in the crankcase. In addition to this, for the first sixty four hours, add one pint of light oil to each five gallons of fuel. After the engine has been properly run in, discontinue the use of light oil in the fuel, but continue its use in the crankcase in cold weather.

The practice of starting an engine for unloading purposes, or to run only a short distance **before** the crankcase is filled to the proper level with a good grade of engine oil, and the cooling system filled to capacity, will result in damage to the engine.

If any new engine is allowed to stand for a considerable length of time, oil drains from the interior parts, causing them to sweat or rust. They may seize when the tractor is started, before the engine obtains sufficient lubrication, particularly in cold weather.

It is recommended that before new tractors are started up, the inspection plate on the side of the crankcase be removed and the interior of the engine be well lubricated by means of a squirt can or brush, giving particular attention to the upper bearing of the oil pump and the helical gear on the camshaft which drives the pump.

General Care of Tractor

By observing a few simple precautions, your Case "DI" Series Tractor will be kept in excellent running condition. These may be summarized as follows:

1. Maintain proper level of good oil in engine.
2. Change oil in air cleaner regularly.
3. Keep cooling system full.
4. Lubricate tractor at regular intervals.
5. Keep tires inflated to correct pressures.
6. Use clean fuel of good quality.
7. Maintain water level in battery over top of plates.

STARTING A NEW TRACTOR

Very likely your Model "DI" Series Tractor has been put in good operating condition by your dealer. However, the following precautions may well be checked to insure that everything is in order.

1. Before using tractor, check all tire inflations and see that front tires have 28 pounds pressure and rear tires have 12 pounds pressure. (See page 83). The pressures are much higher (25 to 30 pounds) when tractors are shipped to prevent bouncing action in transit.
2. Pour a small quantity of light oil into each cylinder through the spark plug holes and crank the engine enough to allow this oil to lubricate the cylinder walls.
3. Check spark plug gaps. They should be .028 to .032". Plugs are packed with the tools. If necessary, adjust the spark plug points by bending the outer electrode; never attempt to bend the center electrode. Install the plugs using the special socket wrench furnished with the tools; be sure that the copper gaskets are in place to form a gas-tight seal.
4. Check oil level in crankcase and transmission; seven quarts in crankcase and 10 gallons in transmission.
5. Be sure that tractor has been lubricated according to instructions. (See lubrication diagram on page 13), before starting a new tractor.
6. See that there is oil in the lower reservoir of the air cleaner. Refer to page 17.
7. Fill the radiator with clean soft water (Capacity $6\frac{1}{2}$ gallons). Do not run the engine when unloading, or at any time, without putting the full quantity of water into the cooling system.
8. Shut off the valve 1, Fig. 1 in the filter under the gas tank, and fill the fuel tank with gasoline (Capacity $19\frac{1}{4}$ gals.) adding one pint of light oil to each five gallons of fuel, while the tractor is new.
9. Make sure that air vent in cap of fuel tank 2, Fig. 1 is open.
10. Open the drain cock 3, Fig. 1 at bottom of the carburetor and turn on the gasoline. Allow enough gasoline to run through to clean out the fuel line and carburetor bowl, then close the drain cock.
11. Work the clutch pedal 1, Fig. 3 to see that clutch does not stick, that shoe does not bind on brake sleeve and that both engage properly when operated.

OPERATOR'S INSTRUCTIONS

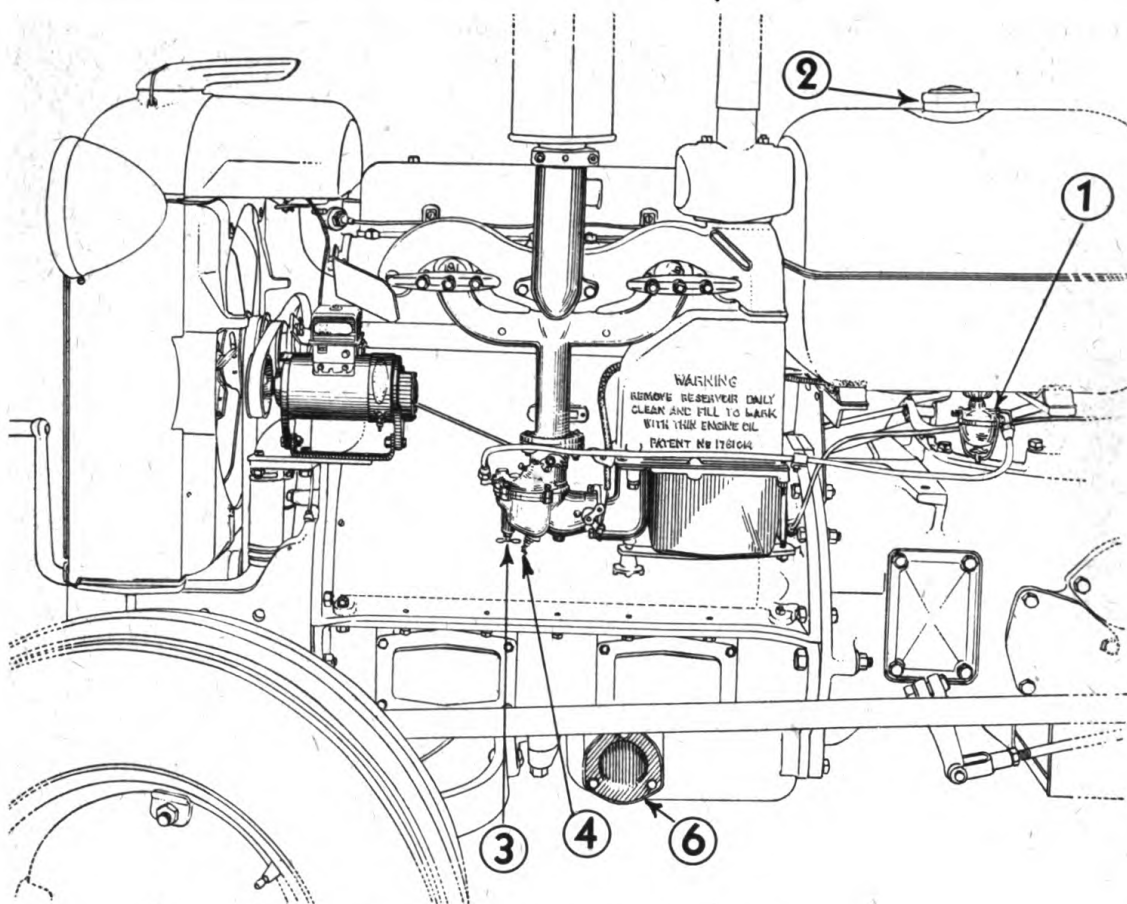


Fig. 1. Left Hand Side of Engine

TO START ENGINE

- A. Turn the carburetor main jet needle valve 4, Fig. 1, $1\frac{1}{2}$ turns counter-clockwise from closed position.
- B. Place gear shift lever 2, Fig. 3 in the neutral position.
- C. Set the throttle 3, Fig. 3 at about mid position. Pulling back on lever 3 opens the throttle and causes the engine to operate at higher speed.
- D. With the magneto grounded crank the engine a few revolutions and observe if the impulse is working freely.
- E. Pull the choke 7, Fig. 3, out $\frac{1}{2}$ to $\frac{3}{4}$ of its full travel when starting the engine when cold. As the engine gradually warms up, push the choke in. No definite set point can be recommended as it will vary slightly on one engine as against another. It functions the same as a hand control choke which has been used on automobiles and trucks for years.

Be careful not to choke the engine too much or the carburetor will "flood" especially when using the electric starter. When the engine is warm it is best to try starting without using the choke at all. Flooding is usually due to excessive choking or to stopping the engine by grounding the magneto with the throttle fully open.

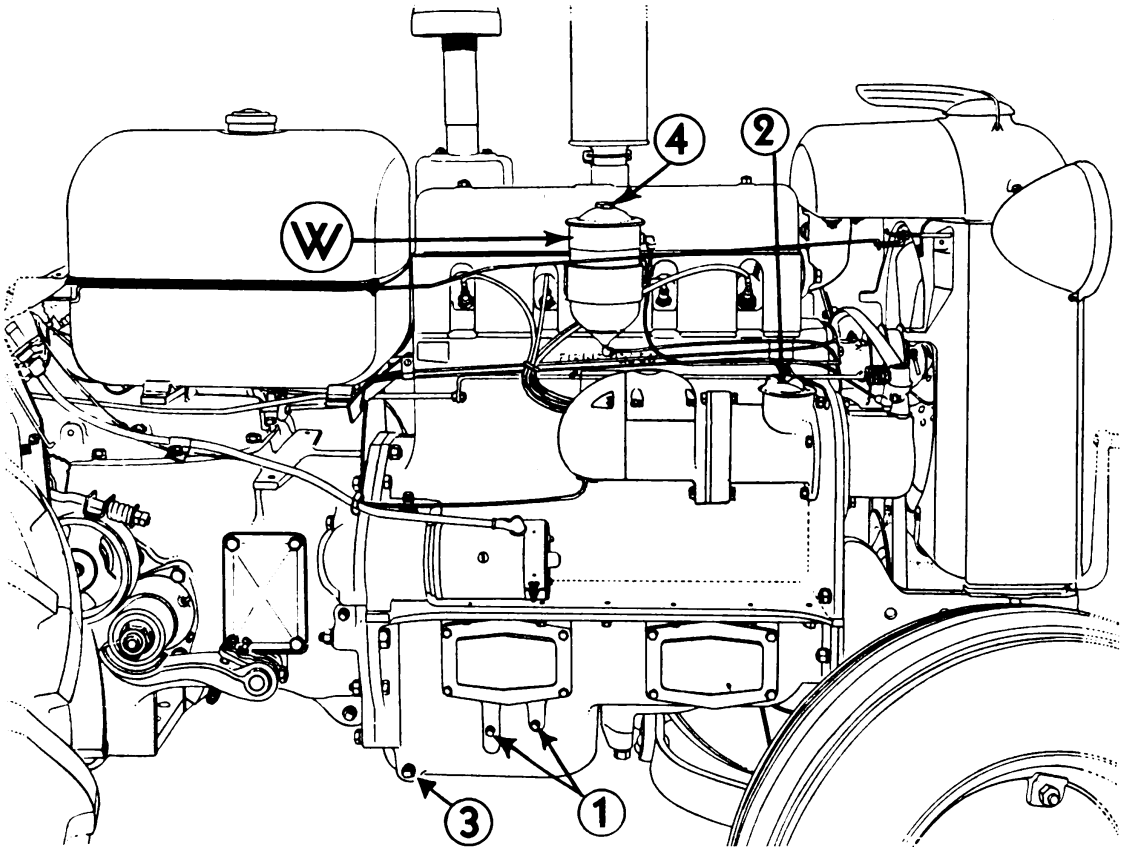


Fig. 2. Right Hand Side of Engine

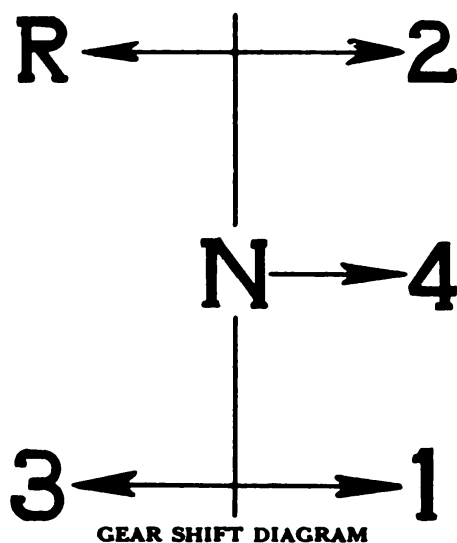
F. Set throttle lever so that engine runs about half normal speed and adjust carburetor needle valve 4, Fig. 1 until engine runs "free" and snappy.

When hand cranking the engine, the crank should be pulled across center by half turns. Increasing the speed of the crank by a moderate quick pull, just prior to passing center, will facilitate starting.

THE COMPLETE OBSERVANCE of one simple rule would prevent many thousand serious injuries each year. THAT RULE IS: "NEVER ATTEMPT TO CLEAN, OIL, OR ADJUST A MACHINE WHILE IN MOTION."

—National Safety Council.

OPERATOR'S INSTRUCTIONS



Driving The Tractor.

Depress the clutch pedal 1, Fig. 3, and shift into the road speed desired, and gradually release the clutch pedal.

The speed selected will depend entirely upon the load and ground conditions under which the tractor is operating. Occasionally the gears will stop with the teeth opposite each other and thereby prevent easy meshing. Should this occur, partly engage the clutch and rotate the gears slowly. The teeth will then mesh readily. This condition occurs more frequently when the tractor is new.

Rubber Tires.

NOTE: When equipped with pneumatic tires, tractors will leave the factory inflated to the pressure recommended by the tire manufacturer, for the sizes and types of tires with which the tractor is equipped.

If equipped with low pressure tires, the tires are inflated to a pressure from 25 to 30 lbs. This is done to prevent bouncing action of the equipment. Before using the tractors equipped with low pressure tires, check all tire inflations and see that the front wheels have 28 lb. pressure and the rear wheels 12 lb. pressure.

To obtain best results, keep all pneumatic tires properly inflated at all times. Under inflation is damaging to side walls as well as there is the danger of the tires slipping on the rims.

Approximate speeds in miles per hour with the engine running at 1200 r.p.m. with the size tires indicated:

Tire Size	M.P.H. 1st Speed	M.P.H. 2nd Speed	M.P.H. 3rd Speed	M.P.H. 4th Speed	M.P.H. Reverse
12.00x24	2.24	4.29	5.91	11.93	3.39

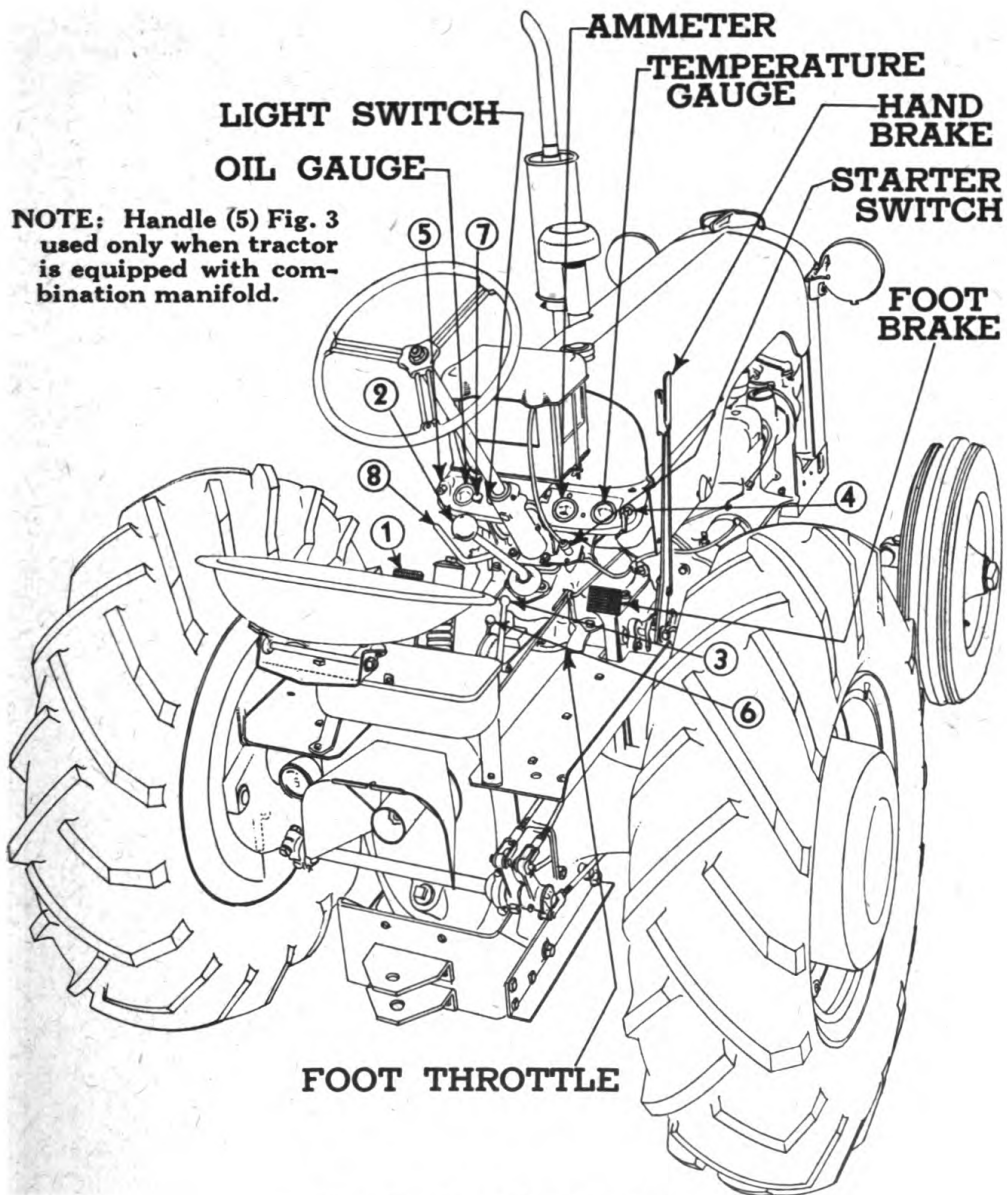


Fig. 3. Operating Controls

OPERATING SUGGESTIONS

Running in a New Engine

The Case "DI" Series Tractor has been designed to efficiently handle a wide variety of work within its range of speed and power. Fuel consumption on light drawbar loads, can be improved by using as high a transmission ratio as possible and throttling the engine down to a lower speed if necessary to keep ground speeds within reasonable limits. On the other hand, if any tractor is subjected

to loads beyond its power range, all working parts will be unnecessarily strained, and if continued over long periods of time, unnecessary expense and excessive engine stalling will be experienced. Best results are obtained with the engine operating at about three-quarter load.

Stopping Tractor

It is recommended that the engine be throttled down before disengagement of the clutch. If the tractor is to remain standing, place the gear shift lever 2, Fig. 3 in neutral and apply the hand brake to prevent the possibility of the tractor starting should the tractor be standing on a grade. It is advisable to shut off the engine to save fuel rather than idling for long periods of time.

A Careful Operator

IS THE BEST INSURANCE

AGAINST AN ACCIDENT

—National Safety Council.

WAR DEPARTMENT CORPS OF

LUBRICATION CHART ENGINEERS



TRACTOR, WHEELED, GASOLINE (CASE MODEL DI)



MFR'S. SERIAL No. located on plate on instrument panel.

TABLE OF CAPACITIES AND LUBRICANTS TO BE USED

UNIT	CAPACITY (Approx.)	LOWEST EXPECTED AIR TEMPERATURE		
		Above +32° F.	+32° F. to 0° F.	Below 0° F.
Crankcase	7 qt.	OE SAE 30	OE SAE 10	Refer to EFSB L-1000-D
Trans. and Diff.	40 qt.	GO SAE 90	GO SAE 80	

TIRE PRESSURE

Front 28 lb.
Rear 12 lb.

Lubricant • Hours

Spring Shackle **CG** 8

King Pin **CG** 8

Front Wheel Bearings **WB** 256
(remove)

Drag Link **CG** 8

Tie Rod **CG** 8

Hours • Lubricant

8 **CG** Front Axle Pivot Pin

8 **CG** Spring Shackle

256 **WB** Front Wheel Bearings
(remove)

8 **CG** King Pin

8 **CG** Tie Rod

KEY

Lubricants

OE —OIL, engine
Crankcase grade
GO —LUBRICANT, gear, universal
CG —GREASE, general purpose
No. 1 (above +32° F.)
No. 0 (+32° F. to 0° F.)
WB —GREASE, general purpose No. 2

Crankcase Level Plugs

Crankcase Drain Plug

Drag Link **CG** 8

Brake Camshaft **CG** 8

Brake Camshaft **CG** 8
(Sparingly)

Rear Axle Bearing **CG** 8
(grease cup)

(Every 8 hours screw cup in
one turn. Refill as necessary.)

Clutch Pedal Bearing **CG** 8

Brake Shaft Support **CG** 8
Bracket

Trans. and Diff. **GO** 1024

Serviced From Under Hood

64 **CG** Water Pump (Sparingly)

64 **CG** Governor Shaft

64 **OE** Crankcase (See Table)
Drain, refill
Check level every 8 hours

64 **OE** Generator (Sparingly)

256 **Oil Filter**

64 **OE** Starter (Sparingly)

8 **OE** Air Cleaner

Clutch Housing Drain Plug

8 **CG** Clutch Brake Sleeve

Trans. and Diff. Drain Plug

8 **CG** Brake Camshaft

8 **CG** Brake Camshaft
(Sparingly)

8 **CG** Rear Axle Bearing
(grease cup)

(Every 8 hours screw cup in
one turn. Refill as necessary.)

8 **CG** Brake Pedal Bearing

8 **CG** Brake Relay Lever

8 **CG** Brake Shaft Support
Bracket

Fig. 4. Lubrication Diagram

OPERATOR'S INSTRUCTIONS

NOTES: ADDITIONAL LUBRICATION AND SERVICE INSTRUCTIONS ON INDIVIDUAL UNITS AND PARTS

Cold Weather: For Lubrication and Service below 0° F., refer to EFSB L-1000-D.

High Temperature: For Lubrication and Service above 90° F., refer to EFSB L-1000-E.

1. **FITTINGS**—Clean before applying the lubricant gun. Unless otherwise specified, lubricate until new grease extrudes from the bearing.

CAUTION: Lubricate tractor after washing.

2. **AIR CLEANER**—Every 8 hours, disassemble, clean all parts and refill to level with OE oil. In dust conditions clean and refill more often. Keep all connections tight and intake pipe and screens clean. (Crankcase breather). Keep crankcase breather clean. Breather is located on engine valve cover plate.

3. **CRANKCASE**—Every 8 hours check and fill to level of upper level plug. Drain only when engine is thoroughly warm. Every 64 hours completely drain crankcase and refill to upper level plug. See table.

CAUTION: When running engine, be sure pressure gauge indicates oil is circulating. (Crankcase oil pump screen). Every 256 hours, remove oil pump screen through left rear crankcase cover, clean and replace.

4. **OIL FILTER**—Every 256 hours remove old element, clean case, and install new element. Refill crankcase to level of upper level plug.

CAUTION: When running engine, be sure pressure gauge indicates oil is circulating.

5. **TRANSMISSION AND DIFFERENTIAL**—Before starting a new tractor make sure that transmission is filled to height of filler spout on rear transmission cover; thereafter every 128 hours check level with tractor on level ground and add gear lubricant if necessary. Transmission and differential should be drained, flushed and refilled after 1024 hours of use. When draining drain immediately after operation.
6. **CLUTCH HOUSING**—Drain oil from clutch housing when completely draining crankcase.
7. **FRONT WHEEL BEARINGS**—Remove wheel, clean and repack bearings. Refer to EFSB L-1000-E for high temperature operation.
8. **REAR AXLE BEARINGS**—Every 8 hours screw cup in one turn. Refill when necessary with CG lubricant.
9. **DRAG LINK**—Lubricate every 8 hours with CG lubricant.
10. **TIE ROD**—Lubricate every 8 hours with CG lubricant.
11. **FRONT AXLE PIVOT PIN**—Lubricate every 8 hours with CG lubricant.
12. **KING PINS**—Lubricate every 8 hours with CG lubricant.
13. **BRAKE CAM SHAFT**—Lubricate every 8 hours with CG lubricant.
14. **BRAKE SHAFT SUPPORT BRACKET**—Lubricate every 8 hours with CG lubricant.
15. **BRAKE PEDAL BEARING**—Lubricate every 8 hours with CG lubricant.
16. **BRAKE RELAY LEVER**—Lubricate every 8 hours with CG lubricant.
17. **CLUTCH PEDAL BEARING**—Lubricate every 8 hours with CG lubricant.

18. **CLUTCH BRAKE SLEEVE**—Lubricate every 8 hours with CG lubricant.
19. **SPRING SHACKLE**—Lubricate every 8 hours with CG lubricant.
20. **WATER PUMP AND FAN**—Lubricate sparingly every 64 hours with CG lubricant.
21. **GOVERNOR SHAFT**—Lubricate every 64 hours with CG lubricant.
22. **GENERATOR**—Lubricate sparingly every 64 hours with OE engine oil.
23. **STARTER**—Lubricate sparingly every 64 hours with OE engine oil.
24. **MAGNETO**—The Case Type JMA Magneto used on this tractor is equipped with sealed ball bearings, as well as oilless bearings which require no lubrication except at time of general overhaul.
25. **OIL CAN POINTS**—Every 64 hours lubricate clutch and brake linkage, throttle and governor connections with OE engine oil.
26. **POINTS REQUIRING NO LUBRICATION**—Clutch Pilot Bearing, Clutch Release Bearing, Steering Gear, Governor, Power Take-Off, Radius Rod Ball and Socket, Engine Rocker Arms.

OIL FILTER—The Oil Filter, shown as "W" in Fig. 2, needs little attention except to see that all connections are tight, and to change the element approximately every 256 hours of operation.

If after operating 256 hours the oil appears to be clean, continue to use it, as it will not be necessary to replace it. An experienced operator, who gives the necessary attention to the air cleaner, as well as to changing the oil at the recommended periods, will not have to change this element so often.

Refill crankcase to level of upper level plug after new element has been installed.

CAUTION: When running engine, be sure pressure gauge indicates oil is circulating.

To change the cleaning element, remove the top nut, after which the filter cover may be removed and the element lifted out and replaced with a new one.

Genuine replacement element assembly is carried under No. 25789-2 and is available through most automobile and truck supply houses, or direct from Purolator Inc., whose address is Newark, N. J.

Starting

Ground the magneto and with the carburetor choked, Turn over the engine a few revolutions, observing if the impulse coupling is working freely. Pull the choke 7, Fig. 3 out $\frac{1}{2}$ to $\frac{3}{4}$ of its full travel and the throttle lever in one-half open position. Put the magneto grounding lever in the running position. Turn over the engine with the electric starter, or by hand. When hand cranking the engine, do not spin, but pull the crank across the radiator instead of in a vertical direction. Increasing the speed with a moderately quick pull of the crank just prior to passing center, will facilitate starting.

Keep the spark plugs in good condition and see that the points have proper gap. Refer to page 54 for further information on spark plugs and ignition.

Slow engine to idling speed before stopping if you intend to start again with the engine hot.

The magneto should not always be blamed for hard starting.

SUGGESTIONS FOR EASY STARTING

Do not always blame the magneto for hard starting. Know What To Do.

In cold weather a good grade of gasoline should be used.

Before attempting to start be sure to see that gasoline, is in the carburetor bowl.

In cold weather a light oil should be used in the engine. OE 10-W is satisfactory and will permit ease of cranking.

Ground the magneto and with the carburetor choked, crank the engine three or four revolutions. At the same time, observe if the impulse coupling is working freely.

Place the choke in the open position and the carburetor throttle in one-half open position.

Crank the engine by using left hand. Do not spin, pull crank across the radiator instead of in a vertical direction, approximately one-half turn. Do not pull the crank too fast as this will prevent engagement of the impulse coupling.

Keep spark plugs in good condition and see that points have proper gap.

Slow engine to idling speed before stopping if you intend to start again with engine hot.

Water in Crankcase

When operating tractor in freezing weather condensation may form in the crankcase, and if left there it might freeze in the bottom of the crankcase and on screen of oil pump which in turn would rob the bearings of oil, this might cause burned out bearings.

To avoid any danger along this line it is advisable to loosen the oil pan drain plug daily after the tractor has been standing a couple of hours and see if it contains any water. It is not necessary to remove the drain plug, simply back it up until but one or two threads are holding and if crankcase contains water it will drain out.

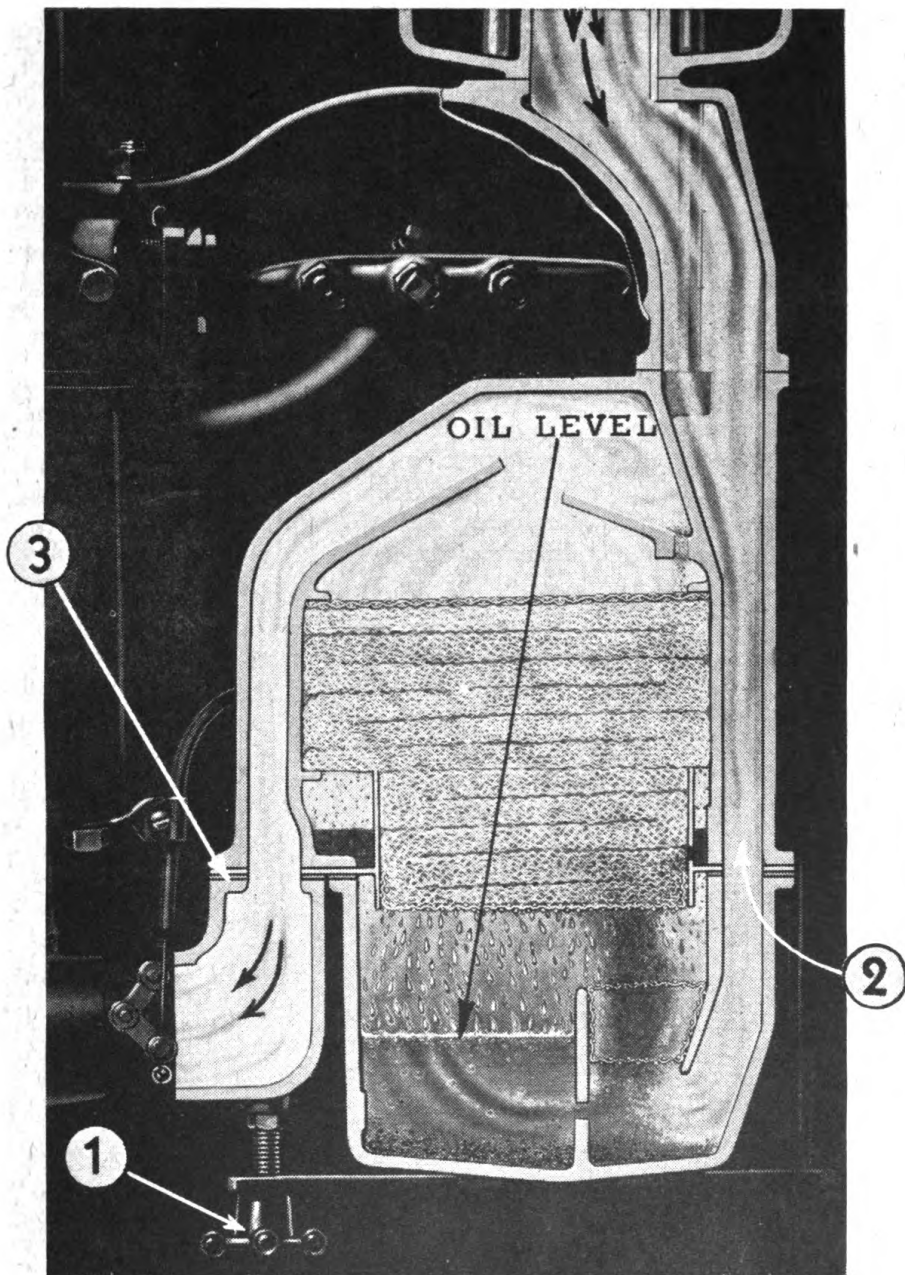


Fig. 5. Air Cleaner

AIR CLEANER

It is necessary to service the air cleaner at least once a day, oftener under extremely dusty conditions, insuring that the intake passage is free of grit and dirt. Also remove the reservoir and change the oil as frequently as above.

To remove the reservoir, loosen hand nut 1, Fig. 5 so clamp strap can be swung to side. Discard the old oil from the reservoir and clean out the leaves, chaff, bugs, and dust. In very dusty conditions, use a long screw driver to dislodge dirt sticking to side of intake passage in body of cleaner. (See 2, Fig. 5). The air cleaner oil reservoir should be removed every 8 hours of operation, or

oftener under dusty conditions, cleaned and filled to the level marked on reservoir with an oil having a viscosity the same as that used in the engine. However, if the engine is operated when the weather is quite cool, it may be necessary to thin out the oil with not more than 15% kerosene or tractor fuel. Do not use gasoline for thinning. A small portion of the oil used in the cleaner may disappear. This is a normal condition and should cause no concern.

It is very important to follow these instructions so that dust and dirt will be removed from the intake air stream. Dirt and dust taken into an engine with the intake air are very harmful as they will cause excessive wear of pistons and cylinders, sticking of valve stems, wear of valve stem guides and may cause valves to become sluggish or hold open so that they will leak and burn.

Care of Inlet Connections

The clean air connections, shown at 3, Fig. 5 should be kept tight, otherwise the real purpose of the air cleaner will be defeated. Occasionally inspect the gaskets between the air cleaner and the carburetor to insure that no leaks are present. Many cases of excessive wear of engine parts have been traced to leaks between the air cleaner and the carburetor, or in the manifold.

Part 2

Maintenance

Of Your Model "DI" Tractor

SERVICE SUGGESTIONS

The following list of causes of engine difficulty has been compiled with the hope of assisting adjustment and also as an aid to locating and correcting trouble.

HARD STARTING OR FAILURE TO START

	Page
Fuel valve closed	7
Spark plugs	54
Defective wires	7
Wires connected to wrong plugs	7
Defective magneto	92
Gasoline flow obstructed	7
Vent in fuel tank clogged	7
Water in fuel supply	33
Improper gas mixture	7
Valves not seating properly	44, 45
Valve tappets improperly adjusted	44, 45
Intake manifold leaking	32

ENGINE MISSING

Fouled spark plug	54
Wrong gap in spark plug	54
Defective wiring	7
Warped valves	44, 45
Valves or tappets stuck	44, 45
Valves improperly adjusted	44, 45
Vent in fuel tank clogged	7

ENGINE OVERHEATING

Lack of water	55
Clogged radiator	56
Water hose clogged	55
Slipping fan belt	50
Leaking valves	44, 45
Improper gas mixture	7
Carburetor choke valve partially closed	33
Improper valve timing	44, 45
Lack of oil	7
Oil diluted	30

MAINTENANCE INSTRUCTIONS

LACK OF POWER		Page
Worn valve seats		44, 45
Valves sluggish or sticking		44, 45
Weak piston rings		50
Piston ring stuck		50
Improper gas mixture		7
Improper timing		44
Oil diluted		30
Air cleaner choked with dust		18
Vent in fuel tank clogged		7
ENGINE KNOCKS		
Loose connecting rod bearings		42
Loose main bearings		47
Loose piston pins		47
Worn pistons and cylinder walls		50
Too early magneto timing		92
Overheated engine		55
Tight pistons		50
Lack of oil or water		7
EXCESSIVE SMOKE FROM EXHAUST		
Carburetor needle valve open too far	} Black	33
Carburetor float sticking		33
Worn piston rings	} Blue	50
Lubricating oil too thin		13
Too much oil in crankcase		14
EXPLOSION IN EXHAUST PIPE		
Ignition too late		92
Weak spark		7
Exhaust valve holding open		45
Exhaust valve warped		45

GOVERNOR

Your tractor has been adjusted at the factory to provide a no-load engine speed of approximately 1367 R. P. M. Full load speed is 1200 R. P. M. Belt pulley speed at full load is 818 R. P. M. The no-load pulley speed is about 930 R. P. M. Normally the governor adjustment need not be changed, and in no case should the full load engine speed be greater than 1200 R. P. M.

To determine engine speed, multiply belt pulley speed by 1.47 (or more exactly $22/15$).

Should the engine speed need changing to bring it back to the setting originally made at the factory, an adjustment can be made by lengthening or shortening the rod connecting the throttle lever on the seat mounting bracket and the governor spring behind the fan on the right hand side of the engine. This adjustment is made just back of the fuel tank forward support. Shortening the control rod increases the engine speed and lengthening the rod decreases the speed. After the proper adjustment has been made, be sure that the lock nuts are fastened securely. In making the adjustment it will be necessary to use a reliable speed indicator (tachometer) or a speed counter.

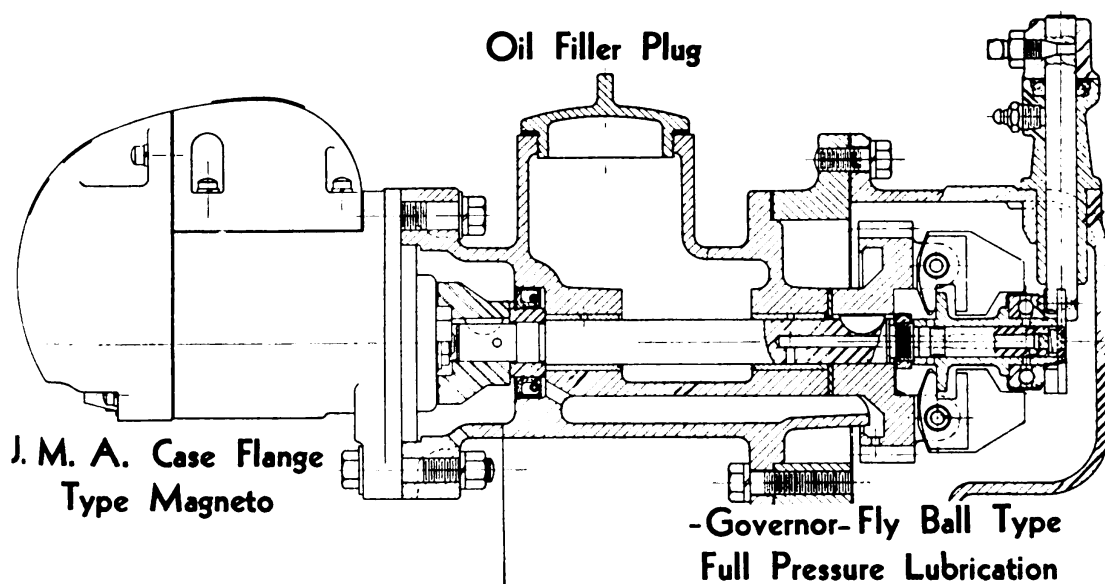


Fig. 6. Governor and Magneto Assembly

MAINTENANCE INSTRUCTIONS

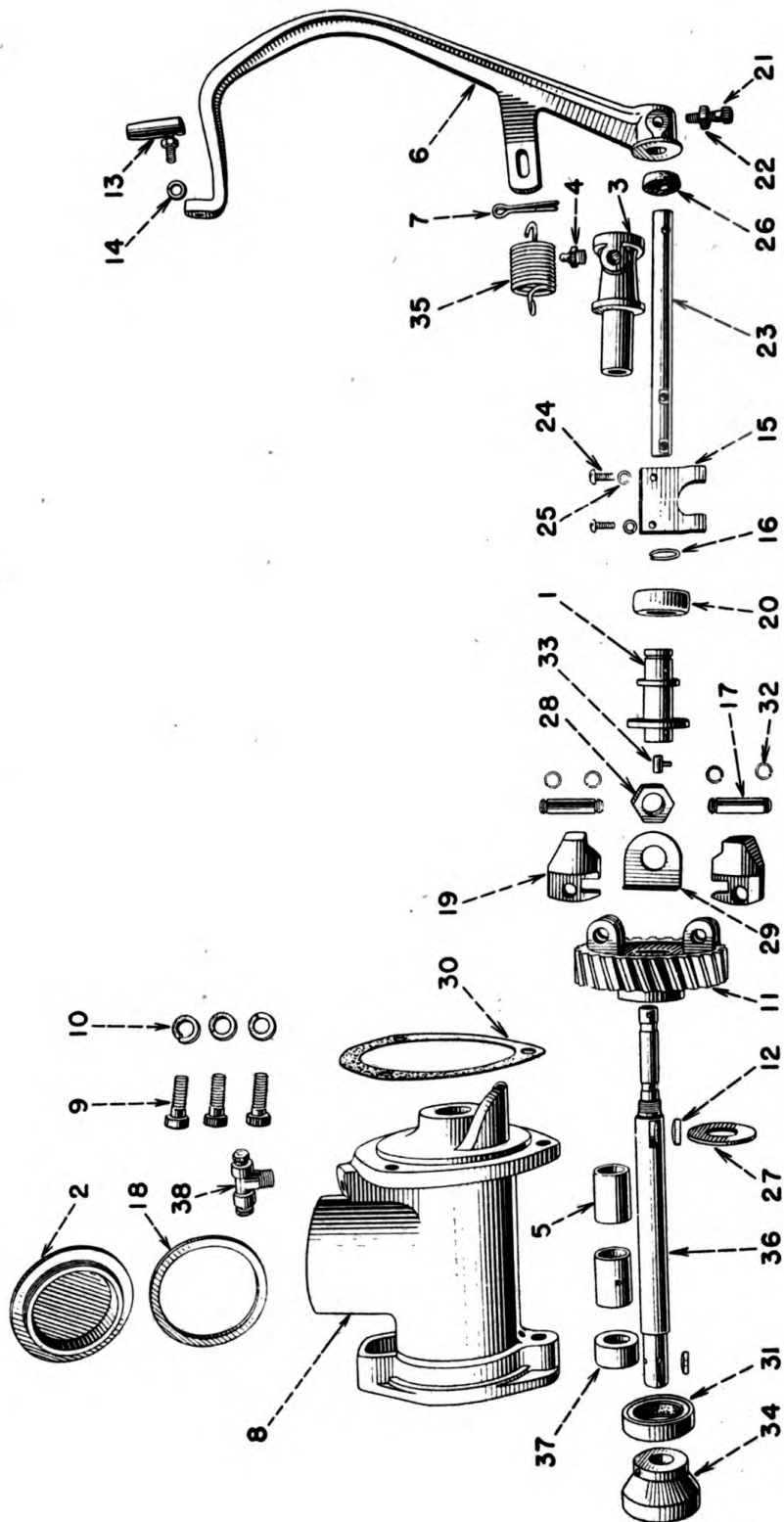


Fig. 7. Governor

INSTRUCTIONS FOR ASSEMBLING GOVERNOR AND GOVERNOR CONTROL ARM WITH CONNECTIONS

(Refer to Figure 7)

Drive plug (33), for governor shaft into governor shaft (36), and drive $\frac{3}{8}$ " x $\frac{5}{8}$ " type 1 groove pin shown in (33) in place. Drive bushings (5) for governor shaft, into magneto bracket (8), and ream to size .376—.377 so governor shaft (36) turns freely. Drive oil seal (31) for governor shaft, into magneto bracket (8) assemble thrust collar (37) for governor shaft and key magneto coupling (34) to governor shaft (36) and drive $\frac{5}{32}$ " x $1\frac{1}{2}$ " type 1 groove pin (40) in place. Place above assembly in magneto bracket (8) with thrust washer (27) for governor gear, and key governor gear (11) to governor shaft (36). Secure the governor to the shaft with lock (29) and nut (28). Assemble thrust bearing (20) on sleeve (1) and secure with snap ring (16).

Place above assembly on end of governor shaft (36) assemble weights (19) to governor gear (11), then secure weights to gear with pins (17) and snap rings (32).

To governor arm (6), assemble security ball joint (13) with $\frac{1}{4}$ " SAE lock washer (14), and governor spring (35) with $\frac{3}{16}$ " x $1\frac{1}{4}$ " cotter pin (7).

Secure governor arm (6) to shaft (23) with set screw (21) and jam nut (22). Put felt washer (26) on shaft (23). Press bearing (3) into timing gear cover, insert governor arm assembly in bearing (3) attach finger (15) to end of shaft (23) with two rd. hd. machine screws (24), and lock washers (25). Fasten assembled magneto bracket with gasket (30) in place, to cylinder block with three $\frac{3}{8}$ " x 1" hex. hd. cap screws (9), and three $\frac{3}{8}$ " SAE lock washers (10). Screw filler plug (2) for crank case with gasket (18) and Dole A 11 Male Tee (38) into magneto bracket (8).

Oil Pump and Screen

Every 256 hours of operation remove the oil pump screen and clean thoroughly. This procedure will protect the finely finished bearing surfaces built into your engine, by insuring that the oil delivered to the bearings is not restricted in its flow through the screen.

To take out screen 6, Fig. 1 drain the oil and remove the three cap screws; this will allow withdrawal of the screen and cap as a unit. Be careful to avoid damage to gasket under the cap or to the screen.

Rinse the screen in a pail of gasoline to remove all dirt, water, or other foreign matter. A dirty screen will not allow oil to flow to the pump intake and the oil gauge will not show pressure; the result—burnt out bearings.

While the screen is out, inspect the interior of the crankcase and clean out any sludge or dirt that may have collected.

Replace screen and tighten cap screws securely. After refilling crankcase with oil, inspect during the first hour or so of operation to insure that no oil leaks are present.

Oil Pressure

The oil pump is equipped with a non-adjustable relief valve. This valve is set to register 30 to 35 pounds pressure on the oil pressure gauge when the oil and the bearings are in good condition.

With continued use of the engine, the pressure may gradually decrease due to the increasing clearance in the bearings, but the pressure should never be allowed to go below 15 pounds at normal engine speed without investigating the cause and correcting it. The following is a list of causes, one or more of which might lead to lack of proper oil pressure:

1. Dirty oil pump screen.
2. Condensation of water in crankcase and freezing around the screen when operating in cold weather.
3. Lack of oil in crankcase.
4. Oil too heavy to flow.
5. Loose bearings.
6. Broken oil pump parts.

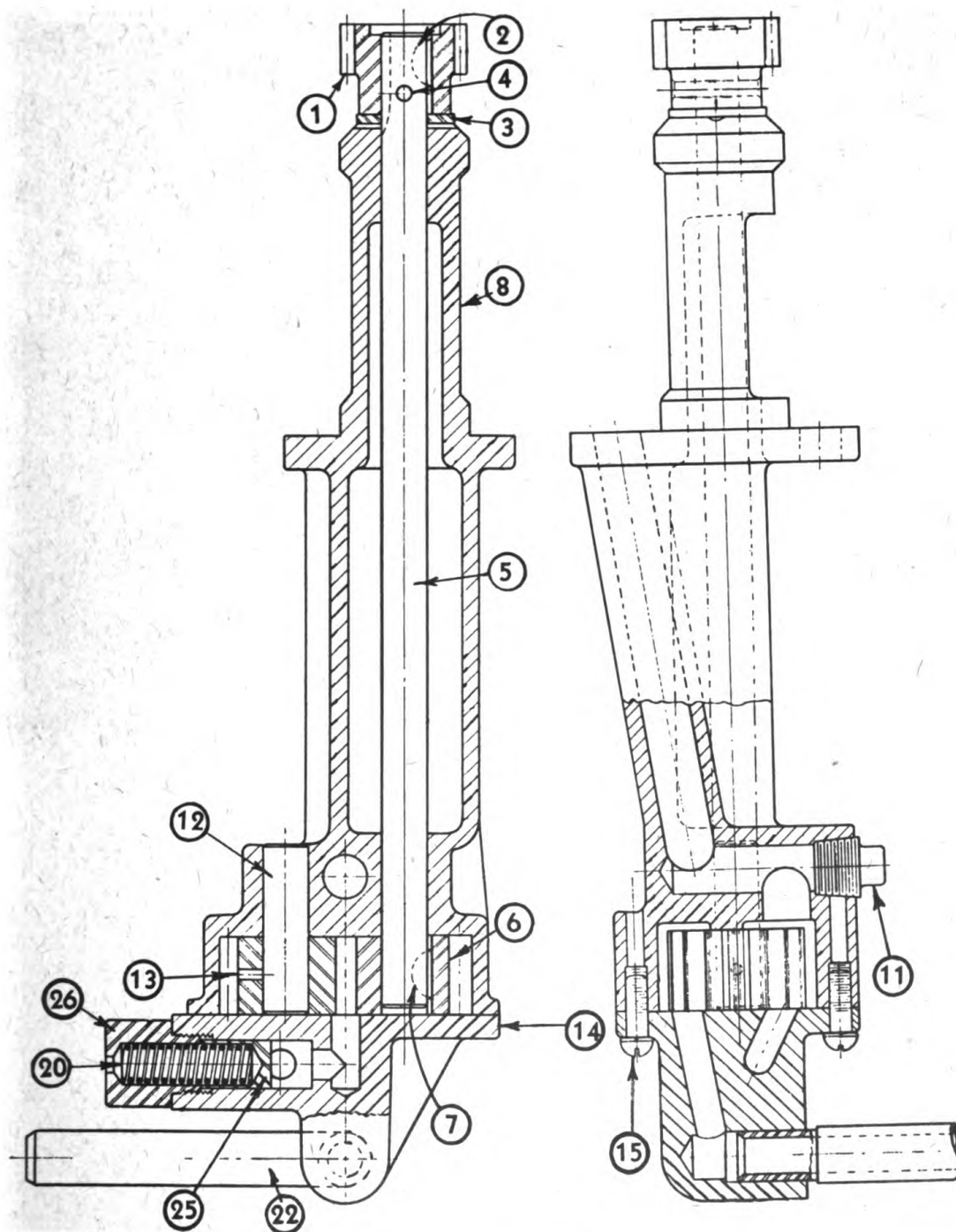


Fig. 8. Oil Pump (Assembled)

MAINTENANCE INSTRUCTIONS

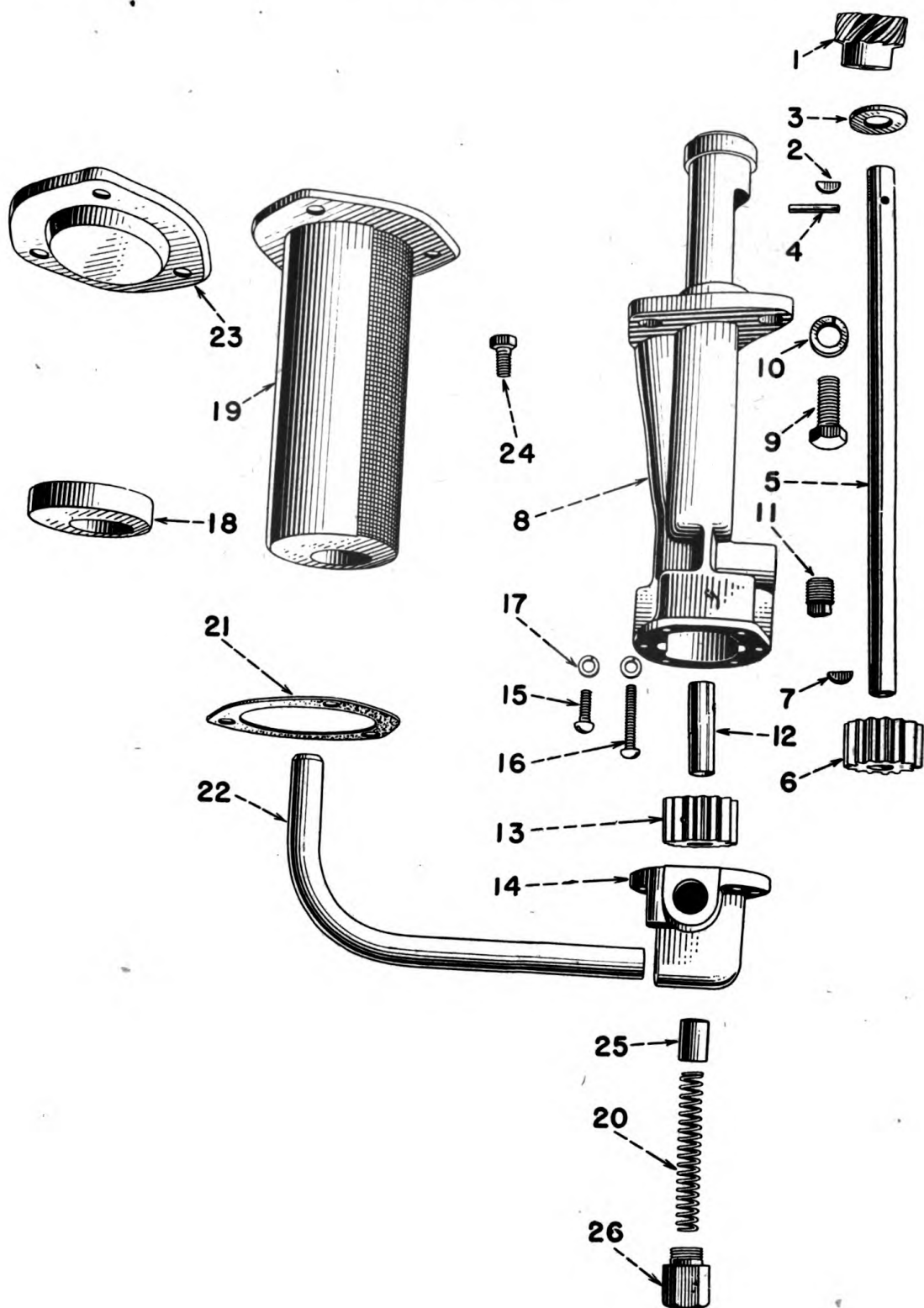


Fig. 9. Detailed View of Oil Pump

INSTRUCTIONS FOR ASSEMBLING OIL PUMP**(Refer to Figures 8 and 9)**

Press stub shaft (12) in body for oil pump (8). Key gear (6), for oil pump on end of drive shaft for oil pump (5), and assemble in oil pump body (8). On the other end of the oil pump drive shaft (5), put thrust washer (3) and key gear (1) and secure in place with pin (4) for oil pump shaft gear. Assemble gear (13) on stub shaft (12). Press inlet tube (22) for oil pump into covers (14). Assemble cover (14) to body (8) with five $\frac{1}{4}$ " x $\frac{3}{4}$ " rd. hd. machine screws (15), one $\frac{1}{4}$ " x $1\frac{1}{2}$ " rd. hd. machine screw (16), and six $\frac{1}{4}$ " SAE lock washers (17).

Assemble relief plunger (25) and spring (20) in place, by screwing nut (26) in cover (14). Attach oil pump assembly to cylinder block with two $\frac{1}{2}$ " x $1\frac{1}{4}$ " hex. hd. cap screws (9) and two $\frac{1}{2}$ " SAE lock washers (10).

Place gasket (21) on oil pump screen (19), assemble oil pump screen (19) with gasket (21) in oil pan with three $\frac{3}{8}$ " x $\frac{5}{8}$ " U. S. hex. hd. cap screws (24) and copper gaskets (27).

Head (18) and flange (23) are top and bottom parts of screen (19). (The assembled oil pump is shown on Page 25.)

After oil pump is assembled, drive shaft should revolve freely. To dis-assemble oil pump drive out pin (4) from oil pump shaft, pull off gear (11) take out key (2), remove washer (3), then take off cover (14).

Screw $\frac{3}{8}$ " sq. hd. pipe plug into oil pump cover (14).

MAINTENANCE INSTRUCTIONS

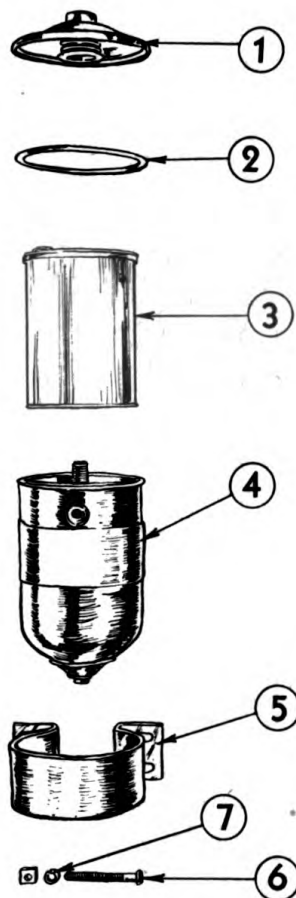


Fig. 10. Oil Filter

OIL FILTER**(Refer to Figure 10)**

This filter needs little attention except to see that all connections are tight, and to change the element (3) approximately every 256 hours of operation.

If after operating 256 hours, the oil is comparatively clean, continue to use it. An experienced operator, who gives the necessary attention to the air cleaner and oil filter, will not have to change this element so often.

To change the cleaning element, unscrew the top nut and remove the cover assembly (1), and the case gasket (2). Lift out the element (3) from case (4) and replace with a new one. Mounting bracket (5) fastens the assembly to the tractor.

Genuine replacement element assembly is carried under No. 25789-2 and is available through most automobile and truck supply houses, or direct from Purolator Inc., Newark, N. J.

COLD WEATHER OPERATION

Obviously certain precautions must be observed when tractors are operated in cold weather.

The cooling system of your tractor should be treated with the same care as the cooling system of an automobile or truck. Prestone, or a similar anti-freeze solution, having a high boiling point, will be satisfactory. Alcohol or alcohol base anti-freeze solutions are not to be recommended as they are more likely to evaporate at low temperatures.

Lubrication

In cold weather, use light oils as recommended on page 14. In exceedingly cold weather it is very important to change oil oftener than in warm weather. Water condensation in the engine crankcase is much greater during cold weather, and if a sufficient amount of water is permitted to collect it may freeze and result in breakage of parts. To avoid any danger along this line, loosen the oil pan drain plug daily, after the tractor has been standing a couple of hours, and see if it contains any water. It is not necessary to completely remove the drain plug; simply back it up until but one or two threads are holding and any water in the crankcase will drain out.

In cold weather see that the oil used in the air cleaner is such that it will not congeal to a point where it will not be carried by the air stream to the filtering screens. If the oil congeals, it can be thinned down by tractor fuel or kerosene.

Water in Crankcase

When operating tractor in freezing weather condensation may form in the crankcase, and if left there it might freeze in the bottom of the crankcase and on screen of oil pump which in turn would rob the bearings of oil. This might cause burned out bearings.

To avoid any danger along this line it is advisable to loosen the oil pan drain plug daily after the tractor has been standing a couple of hours and see if it contains any water. It is not necessary to remove the drain plug; simply back it up until but one or two threads are holding and if crankcase contains water it will drain out.

Storing Tractor

Whenever the tractor is to be stored, or is to remain idle for an extended period, say more than a month, drain all fuel from fuel tank, fuel lines and carburetor. This will prevent oxidation and formation of gum which will clog the passages and interfere with carburetion.

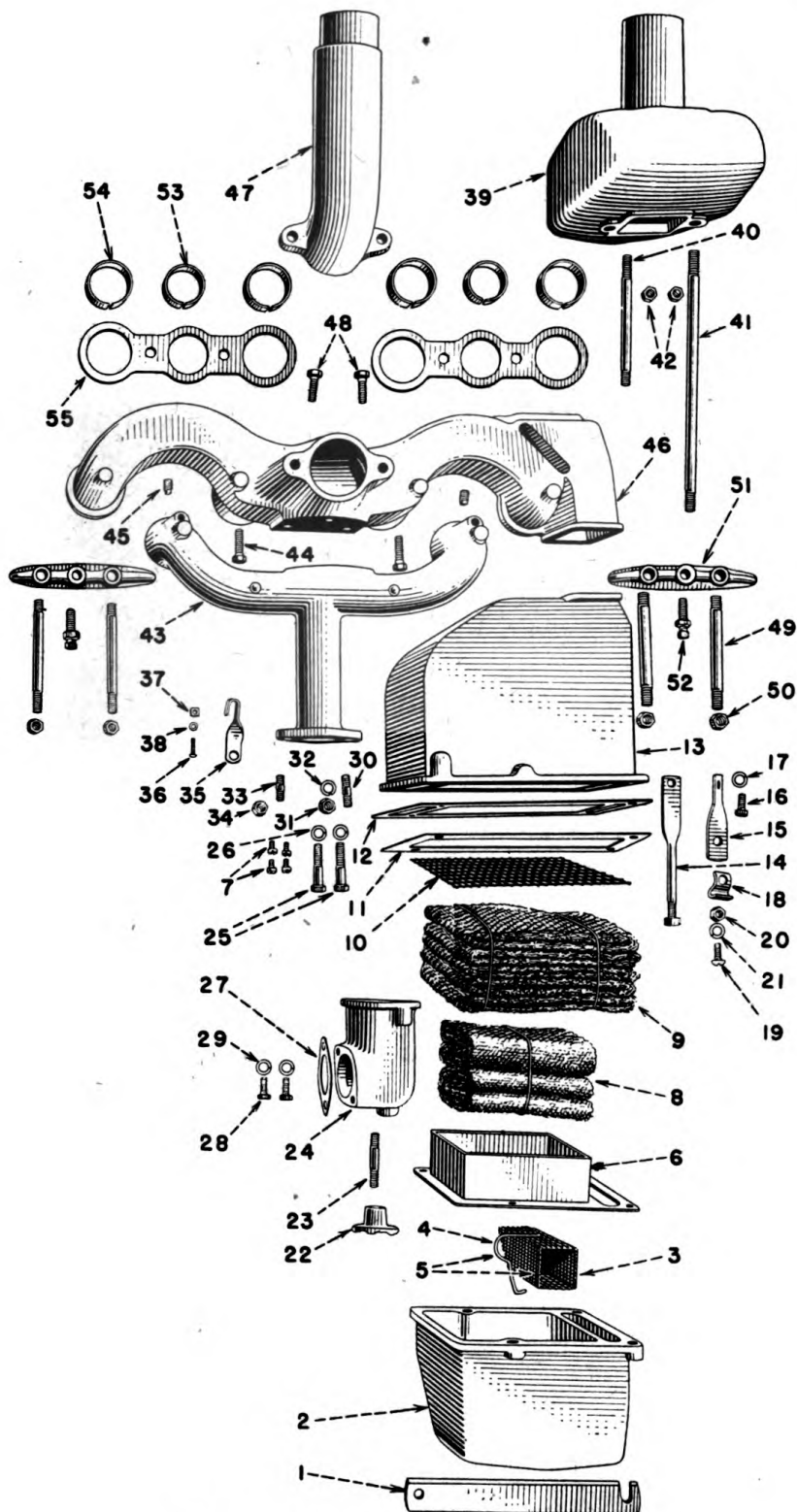


Fig. 11. Manifold and Air Cleaner

MANIFOLD AND AIR CLEANER

(Refer to Figure 11)

The inlet manifold (43) is fastened to the exhaust manifold (46) with two $\frac{3}{8}$ " x 1" hex. hd. cap screws (48). The two $\frac{1}{8}$ " sq. hd. pipe plugs (45) must be inserted in the inlet manifold. The carburetor studs (30) and (33) are screwed into the bottom flange of the inlet manifold (43) with the longer stud (30) toward the rear of the engine. The exhaust elbow (47) for the muffler is fastened to the exhaust manifold by two $\frac{3}{8}$ " x $1\frac{1}{4}$ " U. S. hex. hd. cap screws (44).

The 4 studs (49) are driven into the side of the cylinder head. Ferrules (53) and (54) are inserted into the head, with gaskets (55) for the inlet and exhaust manifolds placed over the studs (49). The manifold assembly is then fastened in place by 2 manifold clamps (51), which are each held in place by two $\frac{7}{16}$ " SAE hex. nuts (50). The two $\frac{3}{8}$ " x $16 \times 1\frac{1}{2}$ " C.P. set screws (52) on the manifold clamp (51) hold the manifold assembly in place.

The parts of the air cleaner assembly are housed in the air cleaner body (13). To assemble the various parts, place the body (13) on its side. Studs (40) and (41) are driven into the body, with the longer stud toward the rear of the engine. Insert the air cleaner upper screen (12); then the upper air cleaner filter pad (9). The lower air cleaner filter pad (8) is placed into the air cleaner box (6). The gasket (10), for the air cleaner box plate is laid on the air cleaner box. This assembly is fastened to the air cleaner body (13) with four, $\frac{1}{4}$ " x 28 x $\frac{3}{8}$ " fillister hd. machine screws (7). The adapter (24) for the carburetor is fastened to the air cleaner body (13) with two $\frac{3}{8}$ " x $1\frac{3}{4}$ " U. S. hex. hd. cap screws (25) and $\frac{3}{8}$ " SAE lock washers (26). The air cleaner clamp stud (23) is screwed into the bottom of the adapter (24).

The air cleaner chaff screen (3) and (4) is clipped into the air cleaner reservoir (2), and the gasket (11) is put on. This assembly is attached to the air cleaner body (13) by clamp (1), whose slotted end fits on the air cleaner clamp strap (14). The other end of the clamp (1) holds the air cleaner reservoir in place when nut (22) is tightened up on the air cleaner clamp stud (23).

The air cleaner assembly is fastened to the exhaust manifold (46) by passing the two studs (40) and (41) through the manifold. The air cleaner oil trap (39) is placed over the studs and the air cleaner assembly is made secure by two $\frac{3}{8}$ " hex. nuts (42).

THE CARBURETOR

The carburetor on the "DI" Series Tractor is simple to adjust, and once adjusted properly, will not need attention for long periods of time. Only three adjustments are provided:

Idling Speed

Idling Jet

Main Jet

The main jet controls primarily the mixture supplied at the higher speeds and loads. The idling jet controls the mixture supplied when idling, and the idling speed adjustment determines the minimum speed of the engine when throttled down and under no load.

For best results, including power, fuel economy, and evenness of operation, these adjustments should be carefully made, and once set, should not be changed unless different temperature conditions in different fuels are encountered. For this reason the make and grade of fuel should not be changed frequently. However, in tractors equipped with the proper manifolds and two compartment fuel tanks, gasoline can be handled during the warmup period without change of the carburetor setting made for burning tractor fuel with the greatest efficiency.

Idling Adjustment

Adjustment for idle speed and idle mixture are best made together, and should be made with the engine warm. The throttle lever on the seat mounting bracket should be all the way forward before starting this adjustment. The stop screw 3, Fig. 12 on the throttle lever should be adjusted so that the engine will idle fast enough to prevent stalling. Then turn the idling adjusting screw 4 in or out until the engine runs evenly. The correct idling adjustment is **usually** found with the idling needle valve between 1 and 3 turns open. A good starting point is $1\frac{1}{2}$ turns from its seat.

Main Jet Adjustment

Since the main jet exerts its principal influence at normal operating engine speeds and loads, it should be adjusted when the engine is warm and working under load. Turning the valve (2) inward provides a leaner mixture, and turning it outward provides a richer mixture.

Turn the valve (2) inward until the engine starts to miss or power falls off; then turn outward until proper operation is secured—about $\frac{1}{8}$ of a turn should be sufficient. This should provide a setting to give maximum fuel economy with very nearly maximum power.

Should the original setting be such that the engine will not run, an approximate setting can be made as follows: Turn the main jet valve (2) inward until the needle just seats; be careful not to force the point against the seat, as so doing may ruin the seat. Then turn the valve outward approximately $1\frac{1}{2}$ turns; this adjustment is sufficiently close that the engine can be operated until final adjustment is made.

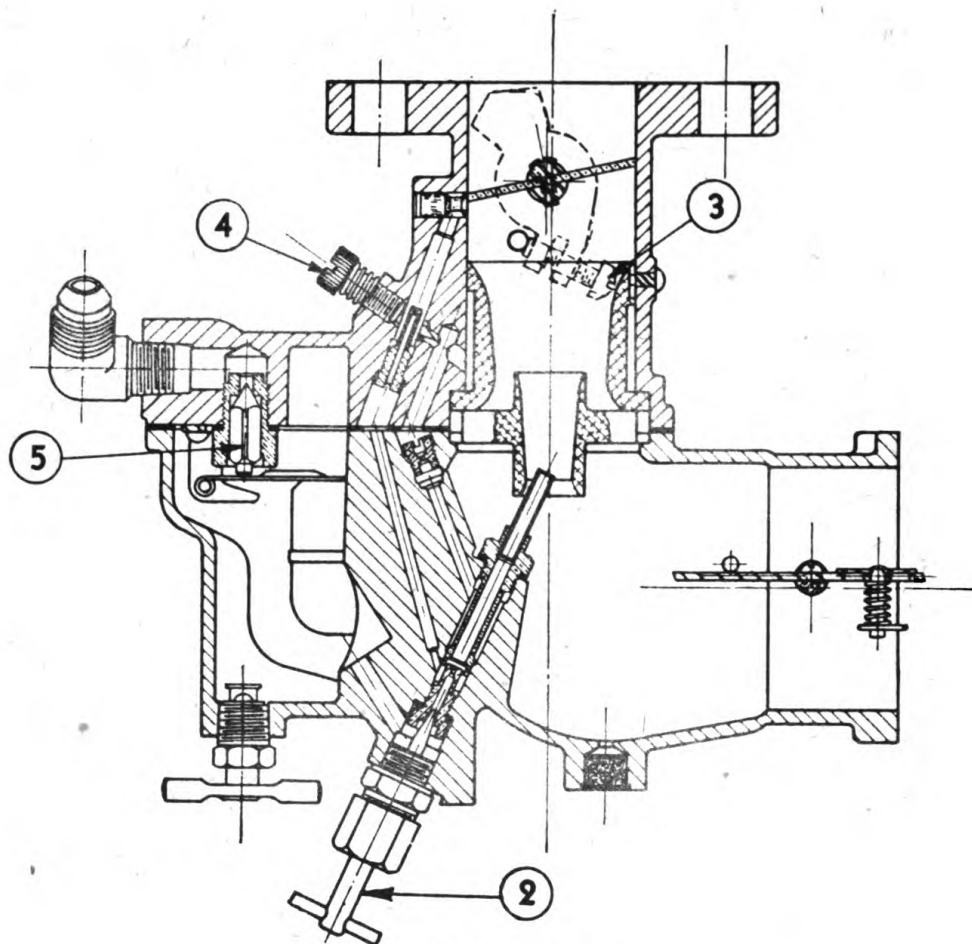


Fig. 12. Carburetor

A lean mixture is indicated by loss of power and spitting through the carburetor, especially when the engine is accelerated by pulling lightly on the throttle rod. A rich mixture is indicated by sluggish action of the engine, and by the appearance of black smoke at the exhaust. The final setting should be as lean as possible and still have satisfactory engine operation and power.

Fuel Strainer

The Zenith carburetor is especially designed for heavy duty service and has no moving parts which affect the mixture delivered to the engine. Hence about the only things that can disturb its functioning are improper adjustment or dirt and water in the fuel. The first difficulty can be avoided by leaving the adjustments alone once they have been properly set. The second difficulty is minimized by keeping the fuel strainer, under the main fuel tank, clean.

Keeping the fuel clean will prevent trouble due to clogging of the strainer. Water in the fuel is particularly troublesome, as it may not all be removed before reaching the carburetor. Occasionally open the drain valve 3, Fig. 1, in the bottom of the carburetor bowl so that any water or foreign matter will drain out.

FUEL STRAINER

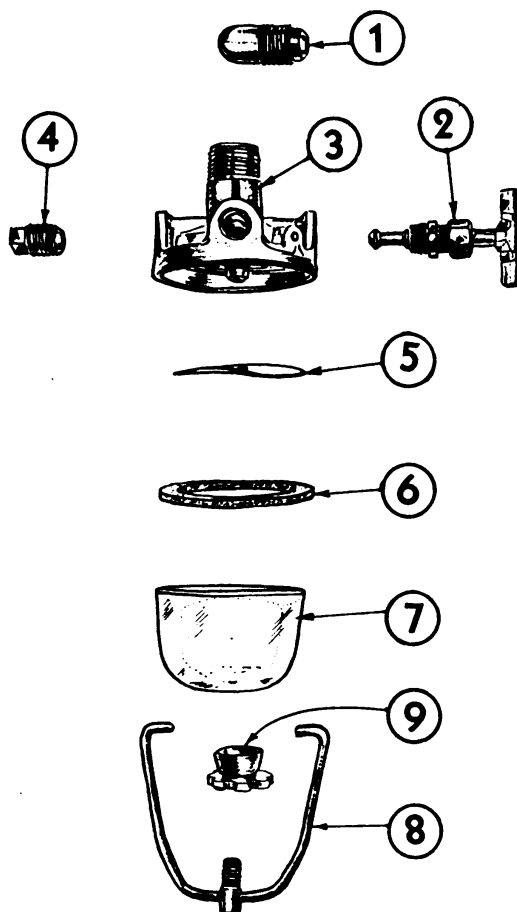


Fig. 13. Fuel Strainer

FUEL STRAINER

Attach nut assembly (9) to bale assembly (8) and attach to strainer head (3).

Assemble fuel strainer elbow (1) needle valve assembly (2) and $\frac{1}{8}$ " sq. hd. pipe plug (4) to strainer head (3).

Assemble screen (5) cork gasket (6) glass bowl (7) to strainer head (3) and secure with bale assembly (8).

This strainer should be inspected and cleaned at least once a week under normal conditions.

To do this shut off fuel supply at needle valve assembly (2) loosen nut assembly (9), and remove sediment bowl (7).

Clean off any foreign matter adhering to screen (5) and also clean bowl (7).

When assembling be sure that gasket (6) is properly installed between bowl (7) and screen (5).

MAINTENANCE INSTRUCTIONS

BREATHER. The valve cover breather should be removed monthly and cleaned out.

PISTON RINGS. 3 compression rings, When compressed to 3.875". .015 to .025 Gap. Top ring groove .0025 to .004 clearance. Second and third ring groove .002 to .0035 clearance. Oil ring groove clearance .0015 to .003.

PISTON PIN. Retained in connecting rod with piston pin clampscrew and washer, select pin .0005 smaller than piston.

CLAMPING SCREW. Foot Lbs. to tighten 45 to 50.

MANIFOLD. Gasoline burning equipment.

CARBURETOR. Float level $2\frac{9}{32}$ "

TUNNEL TYPE PRESSURE LUBRICATION.

PRESSURE LUBRICATION
To main bearings, connecting rods, cam shaft bearings, valve mechanism, timing gears governor and clutch pilot bearing.

OIL PUMP SCREEN. Clean every 256 hours.

VALVE ADJUSTMENT. Clearance between rocker arm and valve stem .018 hot. Gauge furnished with each tractor.

CYLINDER BARRELS. Type used Wet. Barrels are removable. Barrel is .001 to .003 above cylinder block after assembly.

PISTON - FOUR RING GREY IRON
Each set of 4 pistons to be of same weight. Select for fit in cylinder barrel with .005 min. to .006 max. clearance.

CYLINDER BARREL PACKING. Put grease around rubber ring before assembly, do not fill ring groove with grease.

MAGNETO. Case model J.M.A. fixed spark-flange type mounting with automatic impulse coupling. Magneto can be timed with impulse coupling. Impulse coupling should release on top dead center, marked "D" on fly-wheel.

PUSH ROD LIFTER. Special cylinder iron, chilled and ground smooth.

OIL PUMP. Gear type - Equipped with none adjustable relief valve.

Fig. 14. End View of Engine

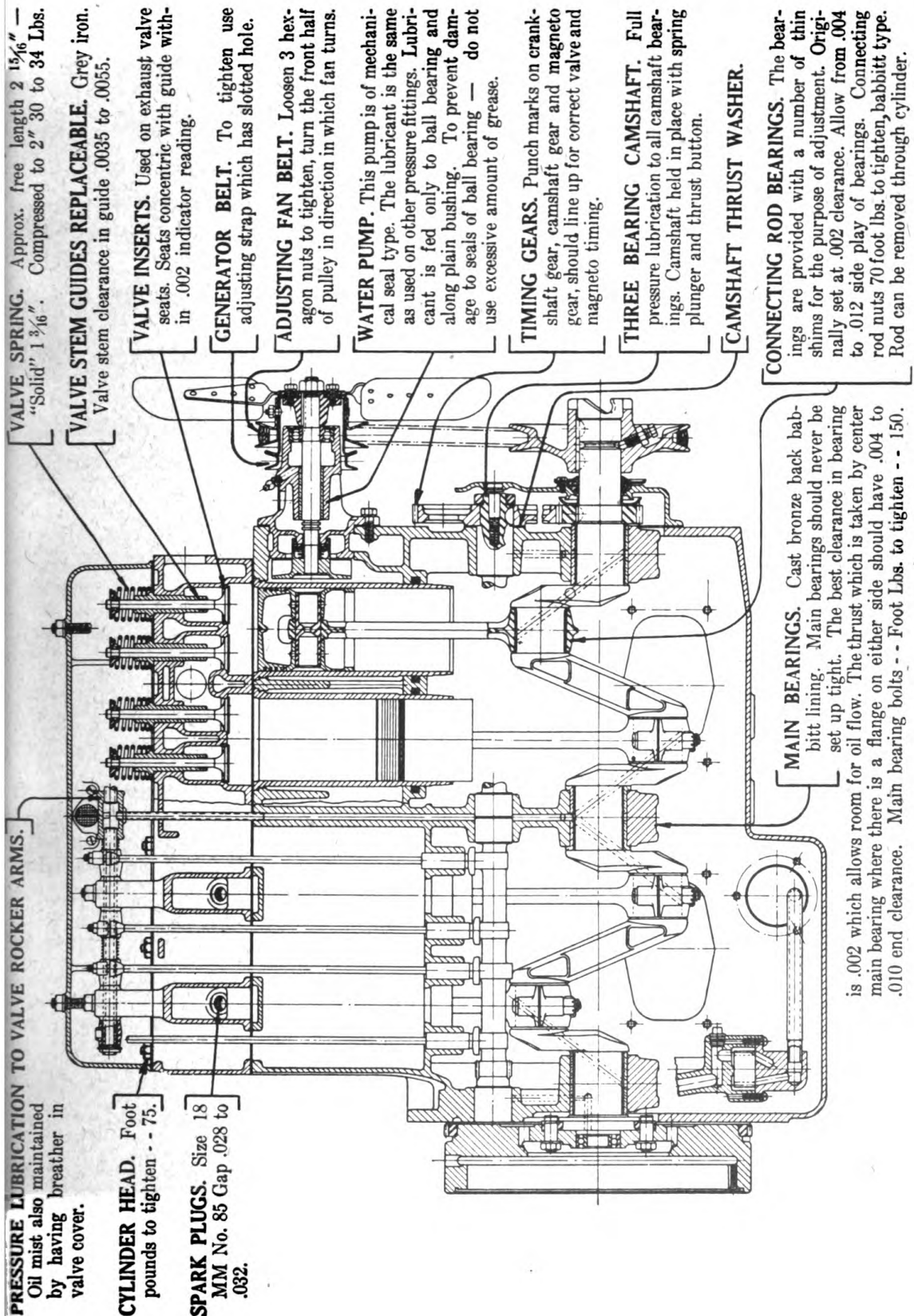


Fig. 15. Side View of Engine

INSTRUCTIONS FOR REMOVING ENGINE

1. Lay two boards on the ground and drive front wheels of tractor onto these boards. The front end of the tractor will then roll easily when splitting.
2. Put gear shift lever into neutral position.
3. Block the rear wheels and apply hand brake.
4. Disconnect spark plug wires to avoid any possibility of engine starting.
5. Drain oil from oil pan and clutch housing, and water from radiator.
6. Remove the hood from over the engine, after removing four rear hood tie bolts and two front fillister head capscrews.
7. Remove section of governor control rod on right side of tractor by disconnecting spring at front end and nut on opposite end.
8. Disconnect shutter control rod on upper right front side of radiator.
9. Disconnect wire at bottom of magneto leading to ignition switch.
10. Disconnect cable from starting motor on right rear side of cylinder block.
11. Disconnect wire on generator leading to ammeter and remove from clip holding wire to water pump.
12. Disconnect headlight wires.
13. Remove heat indicator from radiator inlet elbow and remove two clips holding cable to cylinder head.
14. Disconnect oil line on left rear side of cylinder block.
15. Disconnect choke cable at the carburetor.
16. Remove the fuel line from carburetor to fuel strainer.
17. Disconnect steering drag link at the rear end.
18. Remove radius rod from under tractor.
19. Place one end of long block lengthwise with tractor under lowest part of oil pan. On top of the block, place two heavy planks (about 2 x 8 inches) extending about 6 feet to the left of the tractor and support them with blocks at the extreme end. This method of blocking is used to aid in sliding the front end of the tractor forward in splitting, and also to set the engine on its side to remove crankshaft. (Use chain and tackle if available.)
20. Block up front end of transmission case.
21. Remove all bolts and capscrews from the transmission flange.
22. Roll the front half of the tractor forward until the 2 parts are separated about 1 foot.
23. Block up front end of oil pan and place a plank as suggested in step 19.
24. Remove eight capscrews holding clutch assembly to flywheel and remove clutch as a unit.

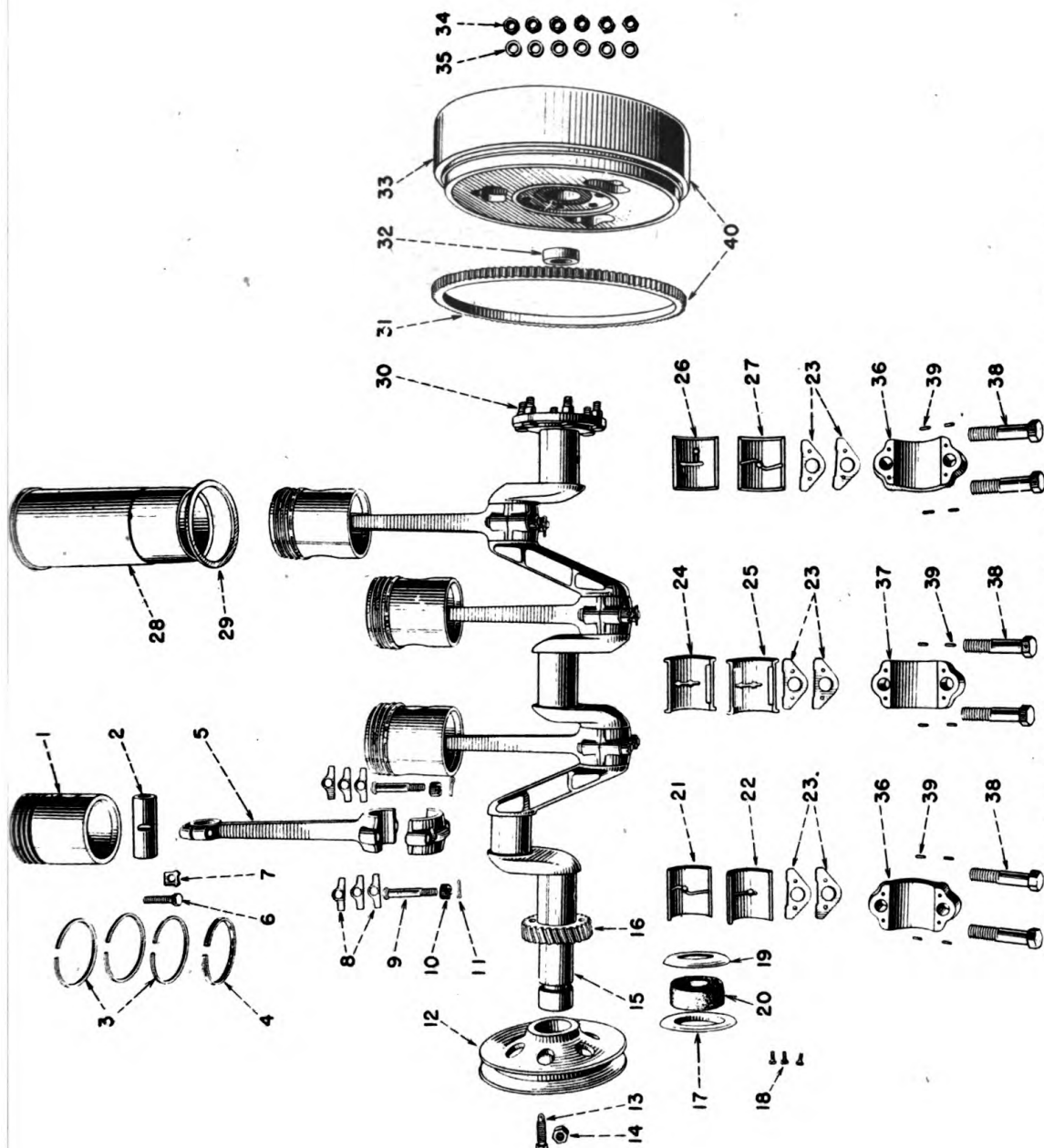


Fig. 16. Detailed View of Crankshaft, Connecting Rods and Pistons

INSTRUCTIONS FOR REMOVING CRANKSHAFT

After the engine has been removed in the manner recommended on page 38, and it becomes necessary to remove the crankshaft, proceed as follows to do this work.

1. Remove flywheel (33) from crankshaft (15) by taking off jam nut (34) and lock washer (35) from flywheel bolt (30).
2. Remove 2 cap screws connecting water inlet elbow to cylinder head and take out gasket to prevent damaging.
3. Loosen both radiator hose clamps and slide hose downward from upper outlet.
4. Block front wheels and remove 8 bolts holding radiator bracket to cylinder block.
5. Remove blocks and roll radiator assembly away from the engine.
6. Loosen adjusting cap screws holding generator to slotted bracket.
7. Remove belt from generator pulley by moving generator.
8. Loosen 3 adjusting nuts on fan pulley and unscrew forward half of pulley until belt is slack.
9. Remove 2 pulleys and belts from water pump body.
10. Remove fan drive pulley (12) from crankshaft (15), by taking out set screw (13) and jam nut (14).
11. Before removing timing gear cover from cylinder block, take off wire and screws (18); also retainer (17) and felt washer (20) from cover.
12. Remove timing gear cover.
13. Remove oil pump screen on left side of oil pan by removing 3 cap screws.
14. Remove oil reservoir from air cleaner to prevent leakage.
15. Carefully set the engine on its left side on planks previously provided. (use tackle and chain if available)
16. Remove oil pan.
17. Remove oil pump.
18. Remove connecting rod assembly through the bottom of the engine.
19. Remove 3 main bearing caps front and rear cap (36) and center cap (37).
20. Take out crankshaft (15).
21. Before installing crankshaft (15) be sure that all parts are clean and work free in ring grooves, pistons free on pins, rings staggered on pistons so ring gaps will not be in line.
22. Reverse above operations for installing crankshaft.

CRANKSHAFT AND MAIN BEARING LINERS

Note: Bearings are adjustable for wear.

The crankshaft is drilled for pressure feed lubrication. The following specifications should be observed:

Bearing journal diameter	2.250"—2.249"
End play of crankshaft	.004"—.010"
Bearing running clearance	.002"
Bearing adjustable	Yes

Proper end play is maintained by the center main bearing, and can be determined by prying the crankshaft endwise with a bar. If a new center main bearing liner is inserted, it must be faced in place to conform with the above limits.

Each main bearing has laminated shims on each side of the bearing cap. Since these shims have $\frac{1}{32}$ " laminations of .002" shims, bearings can be adjusted by simply peeling off the required number of shims.

When new main bearings are assembled it will be necessary to line ream them in place.

The bearings are assembled by heat-treated bolts tightened to 150 ft. lb.

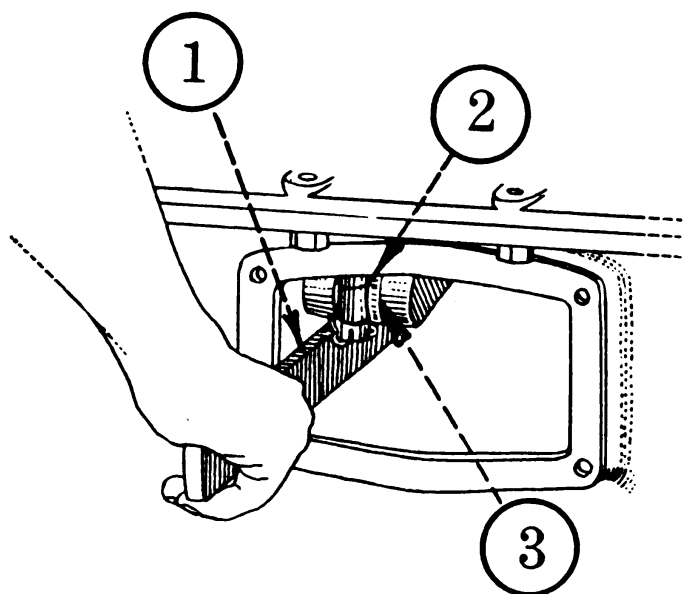


Fig. 17. Testing Play in Connecting Rod Bearings

CONNECTING ROD BEARINGS

NOTE: Remove all spark plug wires to avoid any possibility of engine starting.

ALL BEARINGS ARE ADJUSTABLE FOR WEAR.

By removing the hand hole covers on both sides of the oil pan, the connecting rod bearings can be examined for wear. Crank the engine slowly so that the connecting rod to be tested is on the compression stroke as shown in Fig. 17. By prying under the bearing cap (3) and the bearing bolt (2) with a bar (1), the extent of looseness may be determined by feel.

A marked decrease in oil pressure indicates that bearings are loose and offering little resistance to oil flow.

Each rod has 3 shims, .0025" to .003" thick on each side of the bearing cap. If bearings need adjustment, remove as many shims as needed to provide the proper .002" running clearance. Be sure to remove the same thicknesses from both sides of the bearing caps. If connecting rods require rebabbitting, they may be sent in for exchange for a rebabbitted rod, providing old rod is otherwise in good condition.

When assembling the connecting rod on the crankshaft, note that the numbered sides of both rod and bearing cap are toward the camshaft.

The connecting rod should be straight, free from twist, and parallel with the piston. The connecting rod is assembled by two heat-treated bolts which are tightened to 70 ft. lb.

The following specifications pertain to the connecting rods:

Length center to center	10 $\frac{3}{4}$ "
Crank pin diameter	2.2515" plus .0005"
Bearing material	No. 11 Babbitt, centrifugally spun
Bearing total length	2.120" minus .002"
Bearing running clearance	.002"
Bearing end play	.005"—.012"
Bearings adjustable	Yes
Removable from top of block	Yes
Removable through hand hole covers	Yes

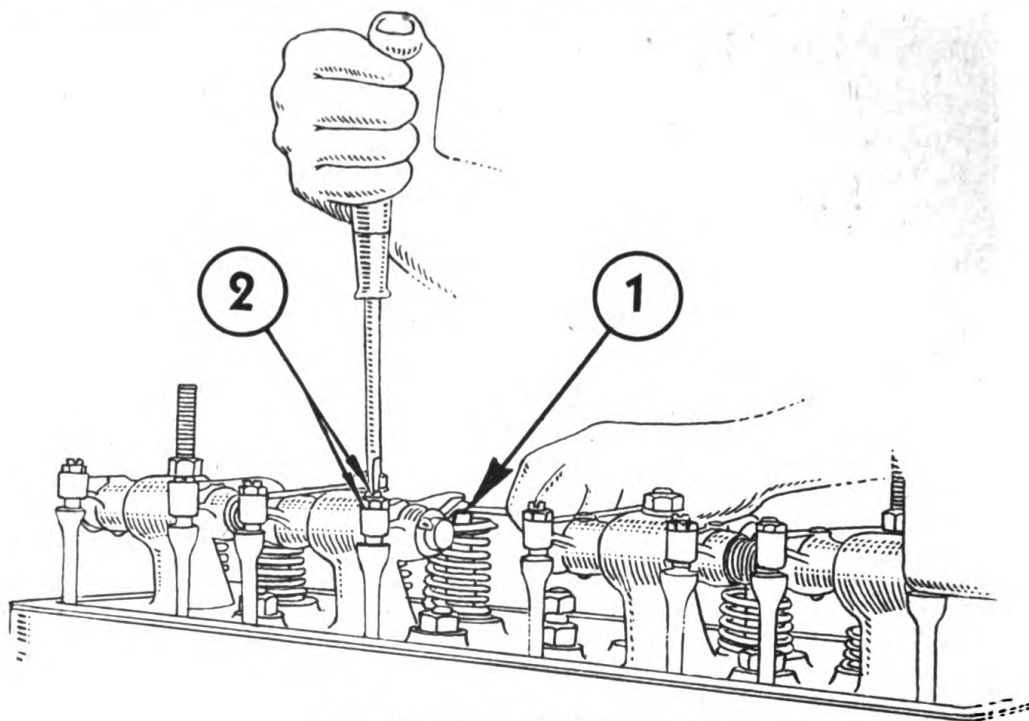


Fig. 18. Push Rod Adjustment

VALVES

The clearance between rocker arms and ends of valve stems should be kept properly adjusted. The gap should be .018" when the valve is fully closed, and the engine warm but not running. A gauge .018" thick (1) Fig. 18 is furnished with each tractor, located on one of the long studs which passes through the rocker arm shaft brackets.

To inspect or adjust valve clearance, the hood and the valve cover must be removed.

Crank the engine until the piston of No. 1 cylinder (next to cranking end) is at top dead center on the compression stroke. In this position the adjustment of both valves for this cylinder can be made. The adjustment of No. 3 cylinder is shown at (2) Fig. 18.

The engine should then be cranked one-half revolution before setting adjustment for No. 3 cylinder. Turn another half revolution for No. 4 and again for No. 2. The engine firing order is 1-3-4-2.

For convenience in setting valve clearance or for valve timing, the rim of the flywheel is marked for dead center and exhaust valve closing for No. 1 cylinder. Remove the plug from inspection hole on R. H. side of clutch housing, and crank engine until mark "D" on flywheel is directly in line with hole. This is top dead center of No. 1, or front cylinder, as well as No. 4, the rear cylinder. The letter "E" stamped $5\frac{1}{2}^\circ$ away from "D" (approximately $1\frac{1}{16}$ ") indicates the point of exhaust closing.

The end of the compression stroke can be detected by noting the action of the valve mechanism; on compression, both valves and pushrods are stationary, while on the exhaust stroke, the exhaust pushrods are holding the valve open. The exhaust valve does not seat until after the piston has reached upper dead center. Therefore, if the exhaust valve is partly open when the corresponding piston is on upper dead center, this cylinder is just completing the exhaust stroke, and the crankshaft should be rotated one full turn before adjusting valve clearance.

Another method of adjustment may be used as follows: Determine the end of the compression stroke of No. 1 cylinder, as explained and adjust the tappets of No. 1 cylinder. Next, turn the starting crank until a distinct "click" is heard from the magneto impulse coupling. When the click sounds, stop the crank immediately and adjust the tappets on No. 3 cylinder. Proceed in the same manner for No. 4 and No. 2. Adjust the valve tappets on each cylinder in accordance with the engine firing order, that is first; No. 1 cylinder, second: No. 3 cylinder, third: No. 4 cylinder and last: No. 2 cylinder.

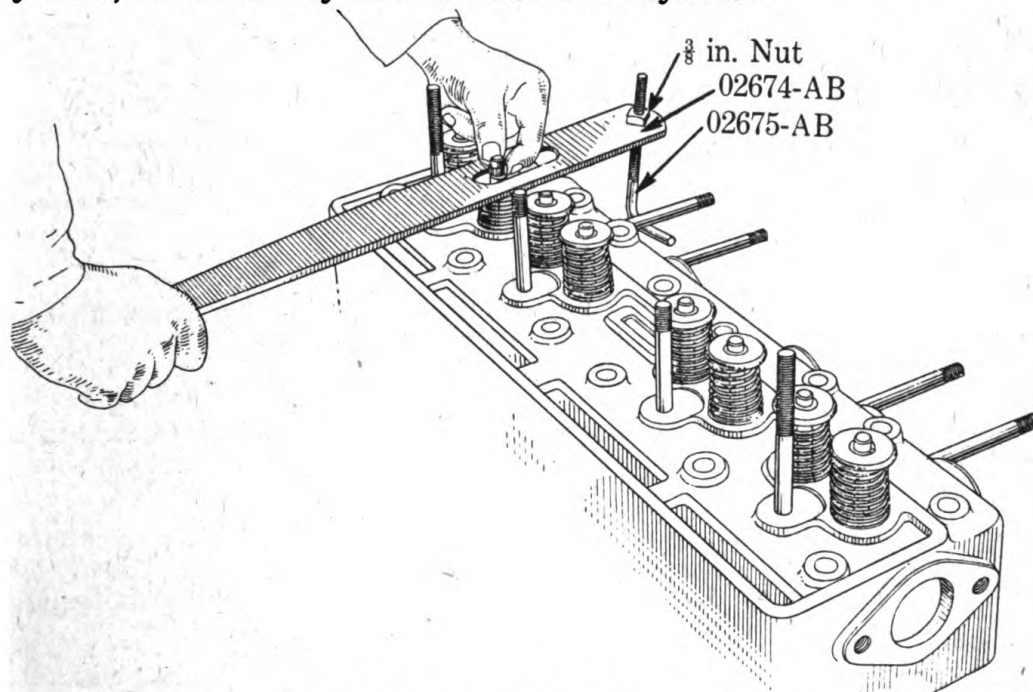


Fig. 19. Use of Compressor Tool 402AA to Remove Valves

TO RECONDITION VALVE SEATS

Lack of compression in one or more cylinders is one of the chief sources of lack of power. An engine with poor compression is inefficient and should not be kept in service in such condition. It is very simple to test an engine for compression leaks by cranking, **but the engine should be run until it has warmed up to working temperature and the valves and other parts properly oiled before such a test is made.** Testing of compression by cranking when the cylinders are cold is mis-leading. If in cranking a warm engine there is not a marked resistance as each cylinder is on the compression stroke, it is probably because of compression leaks past the valves or if the engine has been operated for some months there may be compression leaks **past the piston rings** which require replacement of rings or pistons to put in good condition.

If the compression is poor, remove the valve cover and squirt kerosene on the valve stems and rocker arms to remove any gummy oil accumulation and then oil with light oil. Many times the valves will seat tight after this is done.

Tractor owners should not be alarmed if they hear a slight amount of compression escaping past the valve seats, as valves seldom remain absolutely tight in service and slight leaks are quite noticeable due to the exhaust pipe being so close to the man cranking the engine. Generally speaking, if the tractor has good power, it is best to leave the valves alone. It is time enough to recondition valve seats when they are **known** to be the cause of lack of power.

MAINTENANCE INSTRUCTIONS

The valve seats may be distorted or pitted and when this occurs mere re-grinding will not true up the seat and restore the conditions that are necessary for satisfactory operation. Where the valve seats are to be reconditioned, proceed to remove head which can be accomplished as follows:

1. Drain all water from cooling system, and remove the spark plugs.
2. Remove the metal hood over engine.
3. Remove the valve housing cover.
4. Remove manifold, air cleaner and carburetor, as one unit by removing two clamps on manifold that are held by four studs.
5. Remove the four nuts holding bearing brackets that hold rocker arm assembly, and the rocker arm shaft and assembly can be removed.

NOTE: Before removing the four above mentioned nuts a wire should be placed lengthwise of this assembly to hold same together. This will facilitate reassembly of this unit.

6. Remove the push rods.
7. Remove the nuts from the cylinder head studs. Disconnect the cap screws in front of cylinder head that hold water flange.
8. The cylinder head can be lifted off.
9. Compressor tool No. 402AA shown at Fig. No. 19 simplifies the removal of valves. This tool is part of Case tool equipment and can be obtained from the Company.
10. As the exhaust valve seats are high grade steel inserts they cannot be reconditioned by reaming or hand grinding, therefore, take the head to a reliable machine shop that is equipped with high speed grinders which are necessary to recondition hardened valve seats.
11. After grinding the valves the push rods are usually too long and should be adjusted to .018" when the engine is cold. Use the gauge furnished with the tractor for setting clearance. Refer to Fig. 18.
12. When placing the cylinder head on engine see that the gasket is not damaged or turned up at the edge and that gasket is right side up with holes in cylinder and gasket opposite each other. Tighten the stud nuts securely. After engine has been running long enough to become hot, tighten still more, but be careful not to overstrain the studs.

MAIN BEARINGS

The three main bearing caps may be adjusted for wear without removal of the cylinder block. Remove the oil pan. Determine the bearing play and end play by the use of a small bar. The thrust, which is taken by the center main bearing where there is a flange on either side, should have .004" to .010" clearance.

A thick laminated shim is used on each side of the bearing and thicknesses of .002" can be peeled off to take up for wear. After the shims have been adjusted, tighten the cap screws and lock them securely with wire.

The main bearings should never be set up tight. The best clearance in the bearing is .002" which allows room for oil flow.

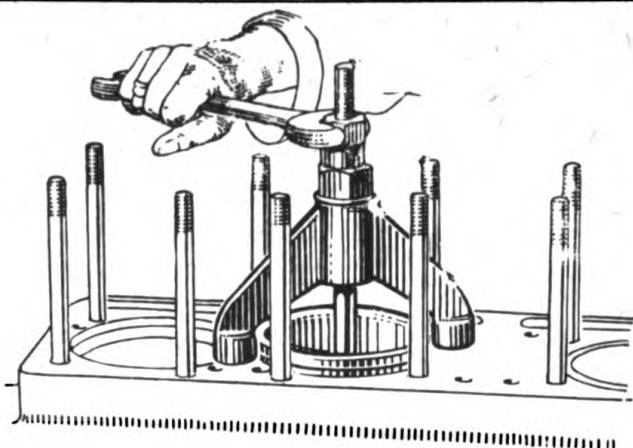
When all bearings are adjusted and properly set, the engine should turn freely with the crank, if spark plugs are not in place.

PISTON PINS

To remove piston pins, back the clamping screw, just inside the piston skirt, free of its threads. The screw must be raised slightly to allow the pin to be removed. In reassembling, the clamping screw and its lip lock washer must be in place in the rod. Raise screw slightly to allow pin to be put in. Line up notch in pin with clamping screw; tighten and lock screw securely by turning the lip of the special washer against the head of the screws. Always use new washers under heads of lock screws.

Piston pins are of a type retained in connecting rod, together with piston pin clamp screw.

Piston pin clamp screw	4 used
Piston pin clamp screw washer	4 used
Length of piston pin	$3\frac{7}{16}$ "
Dia. of piston pin	1.2335 minus .0003
Select pin .0005 smaller than piston.	



Removing Cylinder Barrel

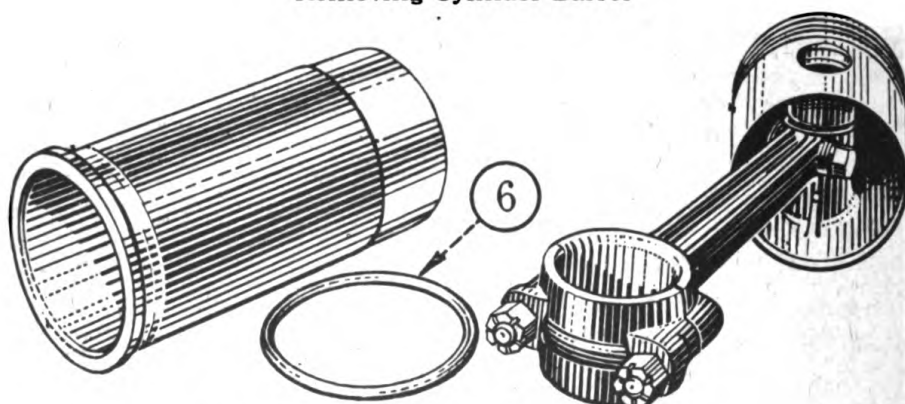


Fig. 20. Removable Cylinder Barrels.

CYLINDER BARRELS

Drain all water from the cooling system, disconnect the spark plug wires and drain the crankcase. Having removed the metal hood over the engine, take off the valve top cover. Disconnect the choke rod, radiator shutter control, heat indicator—(being careful not to damage the element), and fuel line at carburetor. Remove the manifold, air cleaner and carburetor as one unit, by taking off the two clamps on the manifold that are held by the four stud nuts.

The rocker arm assembly can be lifted off after the nuts are removed from the four studs that secure it to the top of the cylinder head. Pull out the push rods and remove the cap screws in the front end of the cylinder head that hold the water elbow flange. Loosen the two nuts that hold the bottom of the radiator at lower outside corners. Remove the nuts from the cylinder head studs and lift off the cylinder head.

Remove the four hand hole covers. By removing the connecting rod bolts, each piston and rod assembly can be taken out by sliding it upward through the cylinder barrel. Each connecting rod is numbered and it is well to note the side of engine on which the numbers appear. Replace the rods in the same position in which they are removed.

The cylinder barrel puller shown in Fig. 20 can be ordered under No. 395-AA for the "DI" Tractor. Its use simplifies the operation of removing the barrel.

Next, remove the barrel and take out the rubber ring, 6 Fig. 20 and clean thoroughly the lower groove in the cylinder block where the ring fits; also note that the shoulders on barrel and in cylinder block should be clean.

Replace the rubber ring, 6 with a new one and fit it into lower groove in cylinder block. Put grease around the rubber ring before it is put in place and

also around lower edge and outside of lower end of barrel, before putting it in block. Do not fill the groove with grease.

While sinking the barrel, note when the end has entered the rubber gasket; push the barrel down in place so that the top shoulder seats in the corresponding shoulder in the block. If when replacing the barrel, resistance is encountered, a block of hard wood over the top of the barrel and a hammer will serve as an effective driver. The final position of the barrel is .001" to .003" higher than the top surfaces of the block; when the cylinder head is put on and tightened down.

The pistons are removed from the connecting rods by backing off the piston pin clamp screw and tapping the pin out. As the pin clears the first hole in the piston and the piston pin bearing, the rod will drop away from the piston. Push the pin the rest of the way out.

Assemble the new pistons to the connecting rods, reversing the above operations, and **be sure** to use a new lock under the connecting rod clamp screw. Line up the groove in the piston pin so that the clamping screw will enter the thread easily. When the screw is tight, bend one ear of lock down and one ear up, to securely lock the clamping screw.

While loosening or tightening clamping screw, never hold the connecting rod in a vise. A piece of round stock $\frac{7}{8}$ " or $\frac{3}{4}$ " tightened in a vise will act as a convenient holder. Slide the assembly over the round stock through the hole in the pin.

Having thoroughly lubricated the pistons and piston rings with a light oil install them in the cylinders in the order and position in which they were removed. Do not attempt to set the connecting rod bearings up tight. When final tightening is accomplished, the bearings should be free.

Put a small quantity of light oil around the edge of each cylinder, and crank the engine over a few revolutions. This will insure lubrication for the first few moments, after which time, the oil thrown from the connecting rods will supply the necessary lubrication.

Inspect the cylinder head gasket against damage and dirt before replacing. Replace the cylinder head and in tightening the cylinder head nuts, observe that they must be tightened evenly and firmly. The center nuts should be drawn up first, working both ways toward the ends. Tighten the bottom corner nuts on the radiator and connect the front water connection. Adjust the tappets to .018" clearance, and after the engine has warmed up, retighten the head stud nuts and recheck the tappet clearance.

After the front water connection has been put back on, the manifold and other removed units should be replaced and connected up. Fill the radiator and inspect for water leaks by looking through the hand hole opening in the side of the crankcase.

Before replacing the hand hole covers, wash out any rust or water that may have dropped in the pan while removing barrels, and fill the crankcase to the high level plug with a good grade of engine oil. Add one quart of light oil to each tank of fuel for approximately the first 96 hours of operation. After this follow instructions on lubrication given on page 14.

Engines that have had new cylinder barrels and piston assemblies installed should be given the same consideration that is given the engine of a new tractor. The piston and cylinder barrels are machined and honed to as fine a finish as the best new automobile that can be purchased today, therefore, treat them in a similar manner until the parts have a running polish.

Many oil retailers recommend oils that are entirely too heavy for the closely fitted and finely finished rods, pistons and cylinders of Case tractors. Much better results are secured by using the light oils.

CYLINDER BARRELS

Type used—wet.

Barrels are removable.

When installing new barrels remove cylinder barrel packing rings from cylinder block, clean out packing ring grooves and install new cylinder barrel packing rings.

When installing barrels in cylinder block, oil or grease outside bottom of barrel for easy installation. Barrels can then be pushed in by hand. Top of barrel should extend from .001" to .003" above top face of cylinder block when in place. Barrels with pistons, rings and piston pins are put up in sets and can be so ordered. These sets have been inspected and checked and are ready for installation.

PISTON ASSEMBLY

Piston material	Special Grey Iron
Clearance at bottom of skirt	.005 to .006
Feeler stock should be used to check piston clearance in barrels	
Go gauge $\frac{1}{2}$ " wide	.005
No go gauge $\frac{1}{2}$ " wide	.006

Rings

Total required	16. used
Compression rings	12. used
Oil rings	4. used
Width compression rings	.1240—.1235
Width oil ring	.2490—.2485
Gap compression ring when compressed to 3.875	.015 to .025
Gap oil ring when compressed to 3.875	.010 to .018
Clearance in groove 1st compression ring	.0025 to .004
Clearance in groove oil rings	.0015 to .003
Clearance in groove 2nd and 3rd compression rings	.002 to .0035
Tension required to close joint on compression rings	10 $\frac{1}{2}$ lbs. to 14 $\frac{1}{2}$ lbs.
Tension required to close joint on oil ring	12 lbs. min.
When installing rings on pistons be sure that rings are free in ring grooves on piston, also have ring gaps staggered so as to not have gaps in line.	
Oil piston and rings when installing in barrel.	

WATER PUMP AND FAN

This pump is of the mechanical seal type, and no attention is required other than periodic lubrication, see page 15, and occasional adjustment of fan belt tension. The lubricant is the same as used for other pressure fittings. Lubricant is fed only to the ball bearing and to a long plain bushing; the sealing member of the pump requires no lubrication, and hence water pump grease should not be used. To prevent damage to the seals of the ball bearing, do not use an excessive amount of grease—one or two shots should be sufficient.

Adjusting Belt

For your safety, remove all spark plug wires to avoid any possibility of engine starting while working on the fan and water pump assembly.

Loosen three hexagon nuts, one of which is shown at 1, Fig. 21 and to tighten, turn the front half of the pulley (2) in the direction in which the fan blades turn. The tension should be just enough to take up any looseness or slack. A properly adjusted belt can be easily depressed 1" by the thumb midway between the pulleys. Too tight a belt causes excessive belt wear, excessive load on the bearings, and does not aid cooling. A V-belt can be run much looser than a flat belt for equal slippage, due to the wedging action of the pulleys. After adjusting the belt, tighten hexagon nuts.

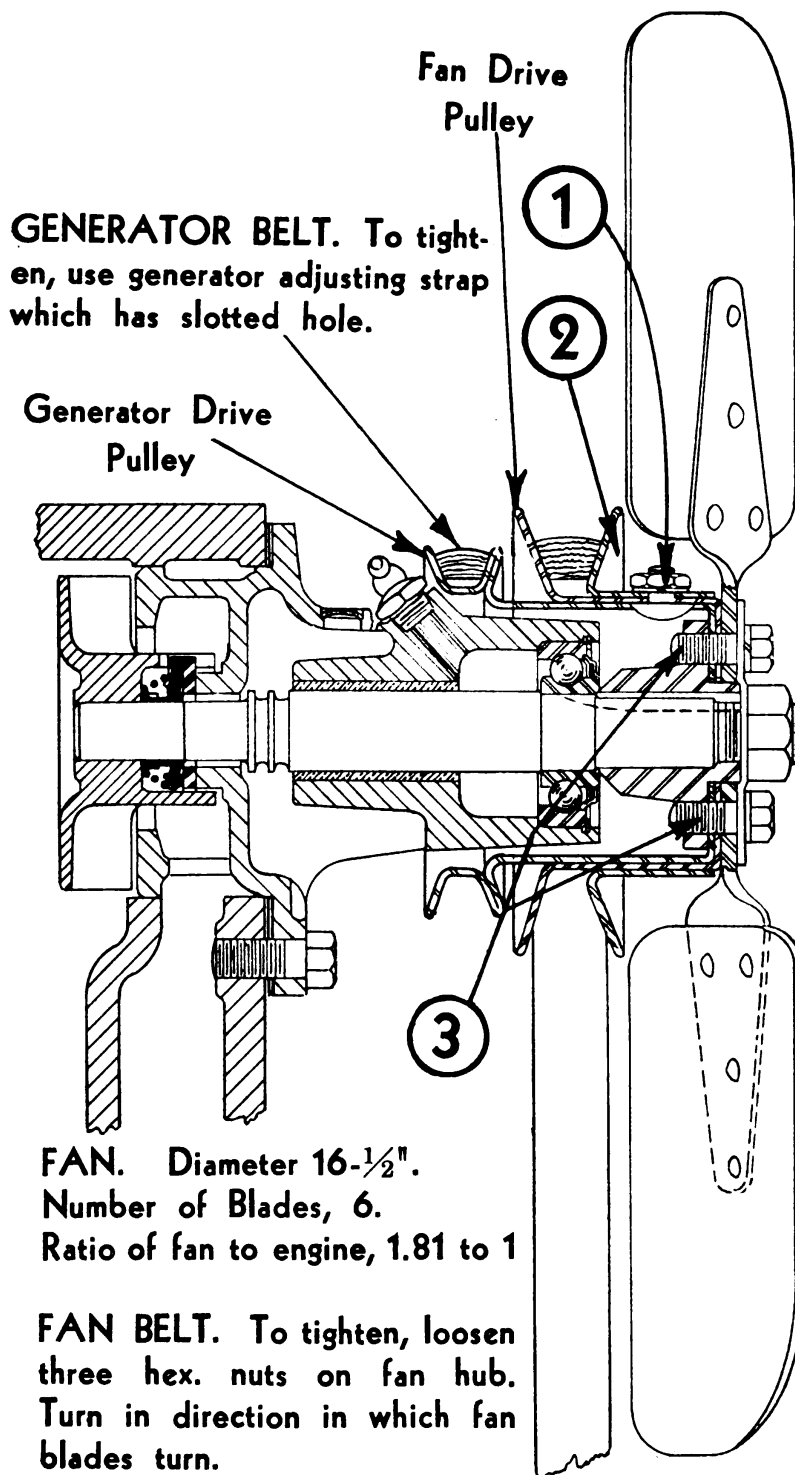


Fig. 21. Water Pump and Fan Assembly

INSTRUCTIONS FOR ASSEMBLING WATER PUMP AND FAN

(Refer to Figure 22)

Press bushing (6) for water pump into pump body (2) then ream to size .8735—.875 so pump shaft (7) turns free.

The water pump impeller (1) which has its parts held in place with snap ring (15) is press fitted on one end of the shaft (7). Spring (18) should be assembled with the small end facing the impeller. The seal spring guide (17) should fit on the flexible seal (20).

The other end of the shaft fits into the pump and through bearing (9), which is held in place by a snap ring (10). The fan hub (14) is keyed to this end of the shaft (7), which drives both the impeller and the fan. A nut (8) holds the fan hub in place.

The fan pulley consists of the adjustable half (22) and the drive hub half (23) fitted together.

This assembly fits over the generator drive pulley (33), which fits over the fan hub (14).

The fan blades assembly (11) is fastened. (Spider portion facing the front) to the hub with four $\frac{5}{16} \times \frac{7}{8}$ cap screws (12).

The nut (8) is locked to the water pump and fan shaft by the lock (28), which is held by two cap screws.

The water pump and fan assembly is driven through a belt (30) by the fan drive pulley (31).

Belt (32) is used for the generator.

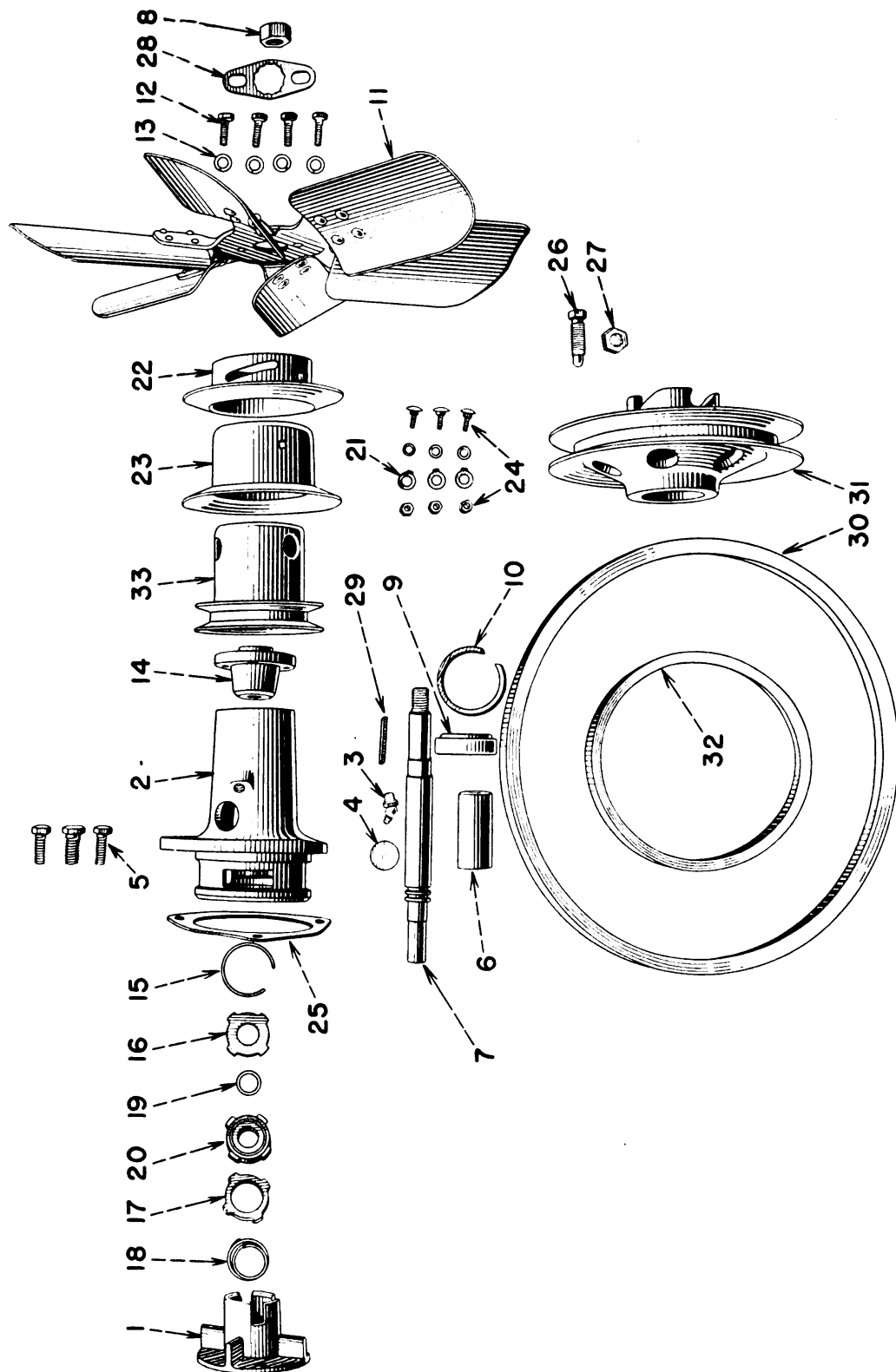


Fig. 22. Detailed View—Water Pump and Fan Assembly

INSTALLING NEW FAN BELT

1. Disconnect spark plug wires to prevent starting of the engine.
2. Remove generator completely.
3. Remove shroud from bottom of radiator by taking out 2 stove bolts.
4. On the fan pulley, loosen 3 hexagon nuts 1, Fig. 21 which hold the adjustment of the fan belt tension shown at 2, Fig. 21.
5. Turn fan pulley in direction of blade rotation to loosen belt.
6. Remove starting crank by taking out 2 cap screws holding the assembly to the radiator bracket.
7. Pass the new belt over the fan assembly by turning the blades.
8. Install starting crank assembly.
9. Pass belt over fan drive pulley by turning engine over with the hand crank and using a screw driver between the fan belt and the fan drive pulley.

INSTALLING NEW GENERATOR BELT

1. Loosen three hexagon adjusting nuts 1, Fig. 21 that tighten or loosen fan belt.
2. Turn fan drive pulley in opposite direction in which fan blades turn. This will loosen belt.
3. Remove fan belt from crankshaft drive pulley by turning engine over with crank and using screw driver between crankshaft drive pulley and fan belt.
4. Remove 4 cap screws 3, Fig. 21 which hold fan blades on fan drive pulley. Drop fan blades in bottom of radiator.
5. Raise fan belt up, pass generator belt under and in place on generator drive pulley.
6. Reverse these operations for removing generator drive belt.

IGNITION

Spark Plugs

The spark plugs in this tractor are of the 18 MM. thread size, A. C. Spark Plug Co. No. 85. Shank length should be $\frac{1}{2}$ ". A gap of .028 to .032" should be maintained between the electrodes. If the gap between the electrodes is too great, due to improper setting or burning, the spark may jump elsewhere in the circuit, resulting in mis-firing. Therefore, it is very important that the gap be maintained properly.

In case one cylinder is mis-firing, the probable cause is either failure of the ignition or low compression. First, as you crank the engine slowly, notice the compression on the cylinder at fault. Sometimes a valve sticks open, which always causes the cylinder to miss. If the compression is satisfactory, replace the spark plug with a new one, or one from a live cylinder. If the cylinder then fires, the trouble was due to a defective spark plug. If further difficulty is experienced, examine all wires leading to the plugs and see that they are in good condition.

When removing or installing spark plugs, use the special socket wrench furnished with the tools.

COOLING SYSTEM

Keep the radiator filled with clean soft water (capacity 6½ gallons). Never run the engine at any time without having the full quantity of water in the cooling system.

Never, under any circumstances, pour cold water into a hot engine in which the water has been allowed to become very low. To do so may result in cracking the cylinder block or cylinder head due to sudden contraction. If necessary to pour warm water into a cold engine that has been drained, add the water slowly to avoid excessive stresses due to sudden temperature changes in the metal.

The operating temperature of the engine is controllable by regulation of the draft through the radiator, thus affecting the temperature of the cooling water; also by regulating the heat of the intake charge by properly adjusting the manifold damper control.

The area that is shut off by the radiator shutter and the length of time it can be left in any one position without causing the engine to overheat is governed by the weather temperature, load and by the direction of the wind.

Ordinarily when operating on gasoline in warm weather, the shutter should be adjusted to its full open position and the manifold damper set in cold position.

Cleaning the Cooling System

At least once a year, particularly in the spring after draining the anti-freeze, the cooling system should be given a treatment with a washing soda solution to remove the sludge and sediment that accumulates. The easiest way is to drain the system and put back in approximately 3½ gallons (half full) of fresh water. Then bring the same amount of water to a boil in a separate container and add all the common washing soda that it will dissolve. While this is still hot, add it to the cooling system to completely fill it. Run the engine as usual for 24 hours, then drain, flush thoroughly, and refill with clean water.

Use of an anti-rust oil is to be recommended to preserve the interior surfaces of the cooling system.

Care of Radiator for Winter Operation

Treat the cooling system of your tractor with the same respect as you would an automobile or truck engine, by using a good grade of anti-freeze.

If one does not want to use one of the higher grades of anti-freeze, alcohol or an alcohol base solution can be used, even though it evaporates at a lower temperature. To prevent loss of alcohol by evaporation, the water temperature must not be allowed to raise above 160° F.

It is time well spent to inspect the radiator hoses and other connections, making sure that they are leakproof, due to the high cost of satisfactory anti-freeze solutions. Originally Ethylene Glycol and Glycerine had a tendency to leak out of systems when sufficiently tight to hold water or alcohol. However, Ethylene Glycol, now commercially available under the trade name of Prestone, is chemically treated to prevent this difficulty, and no trouble will be experienced in holding it in a cooling system in good condition. In addition, Prestone contains an anti-rust ingredient that prevents additional corrosion of the cooling system. For this reason it is advisable to thoroughly clean the cooling system before installing Prestone; also clean in the spring to remove any scale that might have been loosened, but not flushed out, by use of Prestone.

Glycerine which is chemically treated to prevent excessive seepage is also satisfactory, but at the present time it is not commonly available. There are other satisfactory anti-freeze solutions, such as Zerex, which do not vaporize at temperatures under 212° F.

MAINTENANCE INSTRUCTIONS

Under no circumstances should a compound of unknown composition be used, as there are a great many anti-freeze solutions locally available that may prove harmful to your cooling system. Most of these are merely solutions of alcohol, sold for a higher price than is justified by the base constituents which can be purchased in bulk at a considerable saving. On the other hand, there are some definitely harmful anti-freeze solutions which are composed of salts such as calcium chloride, sodium chloride or magnesium chloride, and which should never be used in any cooling system because of electrolytic and corrosive action on the metal parts. Likewise no substances such as lubricating oil, kerosene, honey or sugar solutions, sodium silicate or glucose, should be employed, even though their original cost is low. Fire hazard, destruction of the radiator hoses, and gumming action on the interior surfaces of the cooling system are among the detrimental effects chargeable to the use of such substances.

The radiator grill may become congested with weeds, chaff or bugs and block the passage of air going through the radiator core, therefore, it may be necessary to clean out back of the grill occasionally.

The radiator grill should be kept clean so that the draft through the radiator is unobstructed, otherwise over-heating is apt to result.

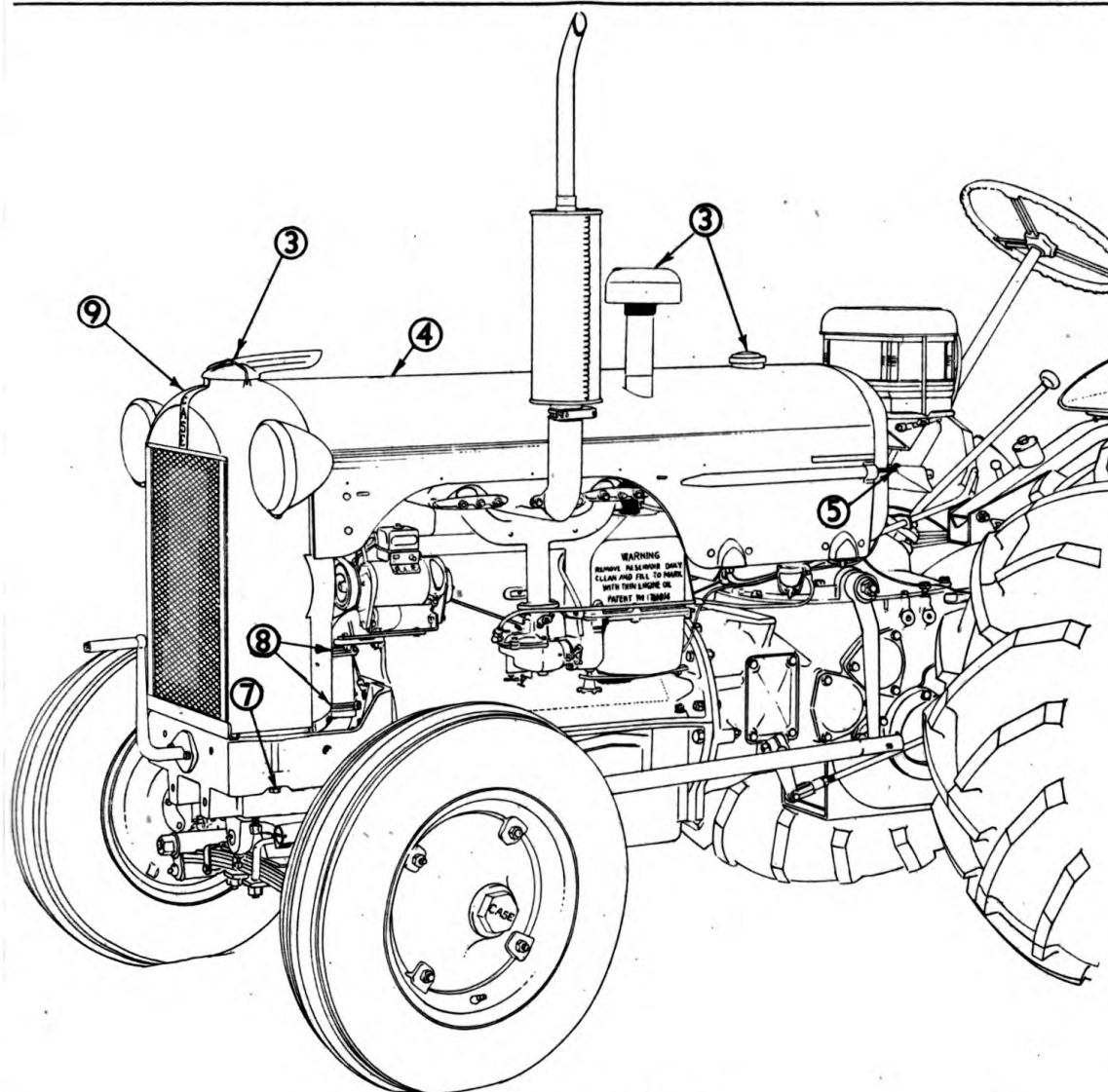


Fig. 23. Removing Radiator

REMOVING RADIATOR

Disconnect spark plug wires to avoid any possibility of starting.

Drain water and remove outlet drain pipe.

Remove radiator cap, air intake pipe, and fuel tank caps 3, Fig. 23.

Remove hood (4 rear hood tie bolts) and (2 front fillister head cap screws), from over engine 4, Fig. 23.

Disconnect shutter control rod 5, Fig. 23 on upper right front side and remove heat indicator from radiator inlet elbow.

Remove 2 cap screws connecting inlet elbow to cylinder head and take out gasket to prevent damaging.

Remove 2 front $\frac{1}{2}$ " x 5" cap screws to unfasten radiator from bracket, 7, Fig. 23.

Loosen both radiator hose clamps; rock radiator to loosen connection, and slide hose downward from upper outlet 8, Fig. 23

Tilt radiator toward left side of tractor and turn fan blades to clear shroud 9, Fig. 23.

Raise and remove radiator.

To install radiator reverse these operations.

KING PINS

The king pin is clamped from turning by use of a threaded tapered pin. If necessary to remove king pin, the tapered pin 1, Fig. 24, must be removed. The caps on the top and bottom of the knuckle should be taken off to allow the driving out of the king pin.

After the king pin has been removed, the spindle and the thrust bearings can be taken out. If the bushings are badly worn, drive them out of the spindle and replace them with new bushings.

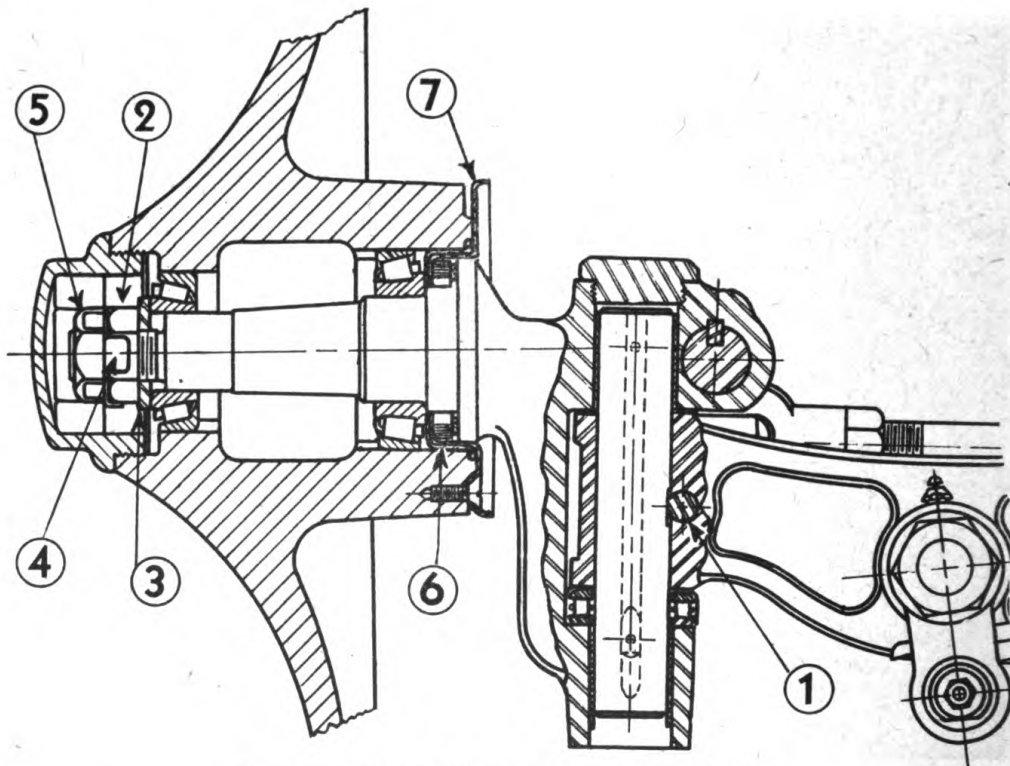


Fig. 24. Front Wheel Bearing Adjustment

FRONT WHEEL BEARINGS

Use a jack or block under the front end of tractor so that all weight is off the wheels when adjusting the bearings. After inspecting all parts to be sure they are free of grit or dirt, pack bearings with a good grade of soft grease.

The adjusting nut 2, Fig. 24, should be drawn up against the flat washer 3, forcing the outer cone inward, and the wheel rotated until the pressure of the nut causes a very noticeable bind in the bearings. The nut should then be backed off one-sixth of a turn, or until the bearings run freely.

After the correct adjustment is obtained, the lockwasher shown at 4 should be put on and clamped against lock nut 5. Examine the adjustment of front wheel bearings every thirty days to make sure that play is not excessive. Pack the bearings in soft grease when assembling and care must be taken not to get dirt in them if they are removed.

Gaskets 6, should always be used between hub and dust shields. Fasten the dust shields 7 securely in place when assembling and keep them tight with the screws provided.

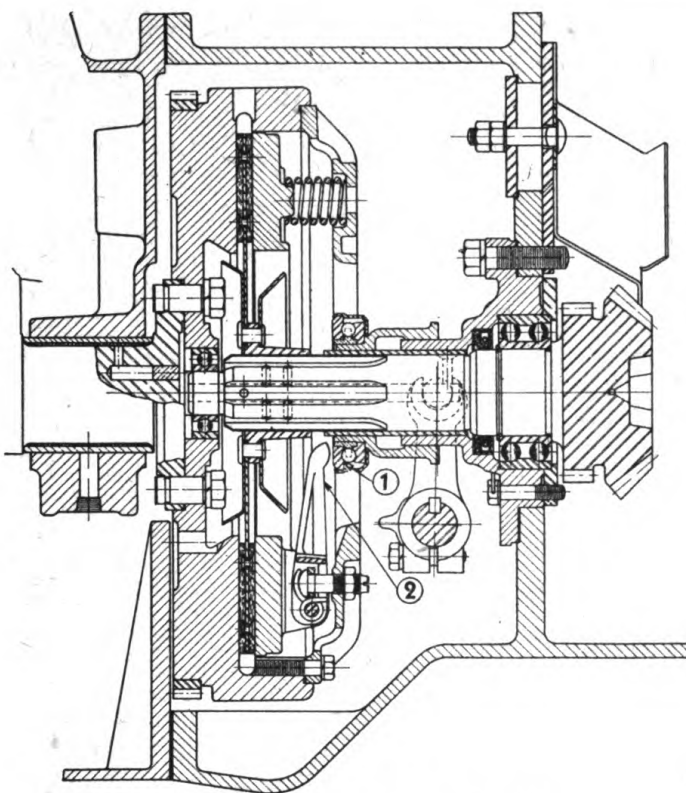


Fig. 25. Foot Operated Clutch

FOOT OPERATED CLUTCH

NOTE: Remove all spark plug wires to avoid any possibility of engine starting while working on clutch.

1. When clutch is engaged, the foot pedal should have one inch free movement measured from the slot in platform to back of clutch pedal.
2. Throwout bearing 1, Fig. 25 must not be in contact with clutch finger (2).
3. Adjust length of pedal connection so as to provide about $\frac{1}{8}$ " clearance between fingers and throwout bearing. When length is correct, the foot pedal can be depressed about an inch before throwout bearing contacts with fingers. By depressing pedal the point of contact can be readily felt.
4. As clutch facings wear, the fingers get closer to throwout bearing and clearance will eventually be used up. Re-adjust length of foot pedal connection before clearance is all taken up.
5. The clutch has been properly adjusted before it was assembled into the tractor. It is self-compensating for wear to the extent of $\frac{1}{8}$ inch wear allowance on the friction material of the clutch plate. After the clutch plate has worn $\frac{1}{8}$ of an inch the plate should be replaced, as when this amount of wear has taken place the rivets used for holding facings to clutch plate have come into contact with the flywheel, on one side, and the pressure plate on the other side.

SPLITTING TRACTOR FOR REMOVING CLUTCH

The clutch can be removed and a new drive plate assembly with facing installed in a short time. To do this, it is necessary to split the tractor. Refer to Figs. 26, 27 and 28.

1. Remove all spark plugs and wires to avoid any possibility of engine starting.
2. Make sure gear shift lever is in neutral position.
3. Block the drive wheels as shown at 3, Fig. 26 and apply the hand brake, also lay two boards on the ground and drive front wheels of tractor onto these boards. The front end of tractor will then roll easily while splitting.
4. Drain the oil out of the clutch housing.
5. Block up the front end of the transmission case, or use a jack as shown at 5, Fig. 26.
6. Remove exhaust pipe and muffler.
7. Remove hood from over the engine.
8. Remove shutter control rod.
9. Shut off gasoline, and disconnect gasoline at the fuel strainer.
10. Disconnect instrument panel from gasoline tank, and remove tank.
11. Remove battery cover and disconnect terminals.
12. Disconnect oil pressure line at gauge.
13. Disconnect tail light wire at switch.
14. Disconnect ammeter wire to starter switch at ammeter.
15. Disconnect instrument panel braces at transmission cover.
16. Place instrument panel with remaining wires on top of engine as shown at 16, Fig. 27.
17. Remove rear half of accelerator rod.
18. Disconnect starter cable at starter, and remove starter as shown at 18, Fig. 26 to avoid damage of starter gear while splitting.
19. Remove brake shoe from clutch throwout shaft as shown at 19, Fig. 26.
20. Disconnect clutch throwout rod from clutch throwout shaft.
21. Disconnect drag link at rear end as shown at 21, Fig. 27.
22. Remove hand hole covers from both sides of clutch housing as shown at 22, Figs. 26 and 27.
23. Remove front fuel tank support, placing it with remaining wires on top of engine as shown at 23, Fig. 27.
24. Remove the $\frac{3}{4}$ " shoulder bolt on each side of flange and replace with two pins $\frac{3}{4}$ " by $13\frac{1}{8}$ " long as shown at 24, Figs. 26 and 27. These special pins can be ordered from any CASE dealer under No. 139AA. Oil these pins and use cotter pins in each end to prevent pins from coming out. These pins will act as dowels to hold engine and transmission case in line when split.
25. Take out all bolts and cap screws from transmission flange, two of which are shown. (See 25, Fig. 26)
26. Roll the front half of the tractor forward until the two parts are separated approximately $9\frac{1}{2}$ ".
27. **CAUTION: INSTALL THREE STANDARD HEX. HD. BOLTS $\frac{3}{8}$ " BY $2\frac{1}{4}$ " LONG, THROUGH HOLES IN CLUTCH BACK PLATE INTO PRESSURE PLATE AND TIGHTEN AS SHOWN AT 27, FIG. 28. THIS WILL KEEP CLUTCH FROM EXPANDING.**

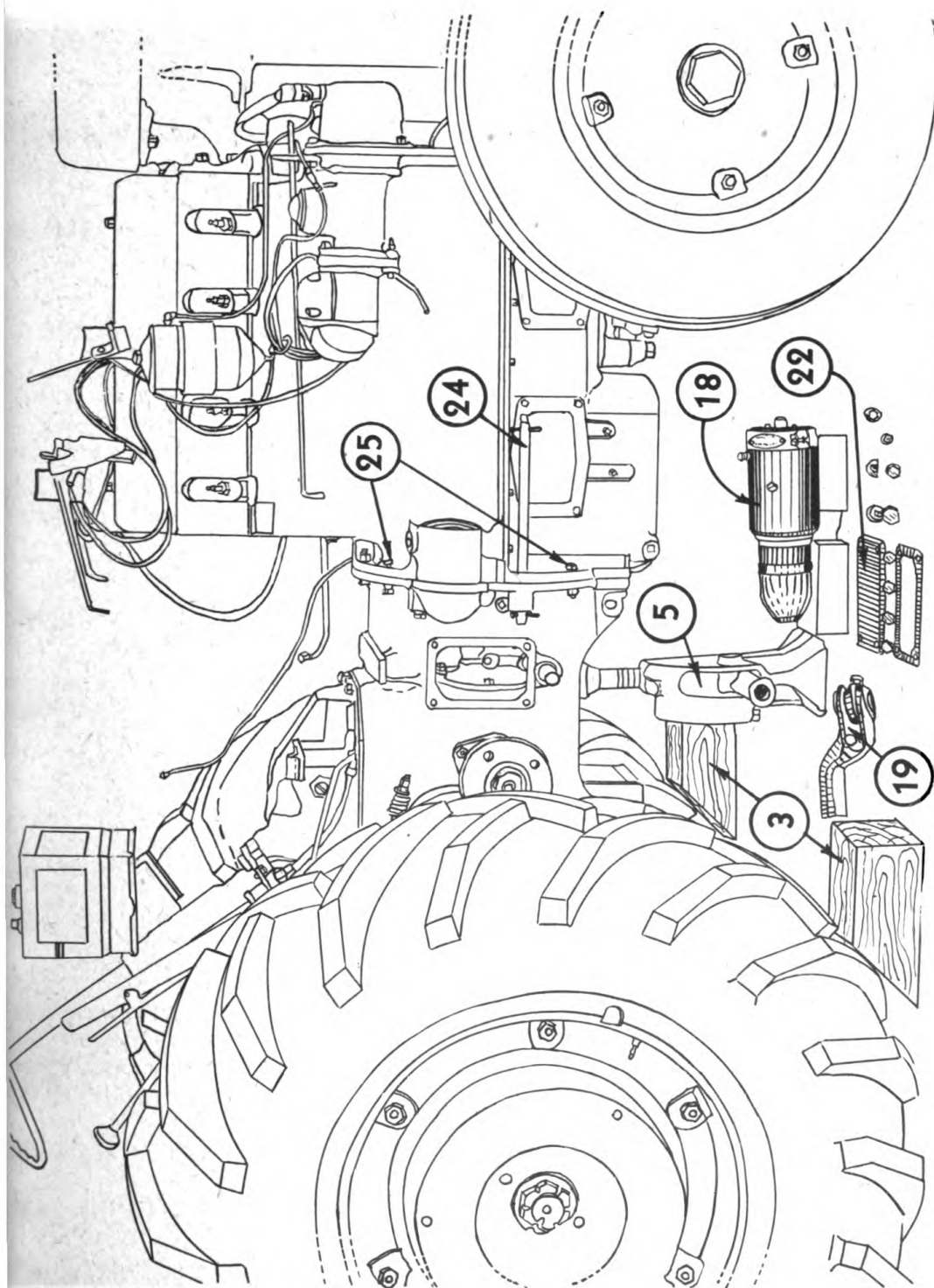


Fig. 26. Right Hand Side View—Preparing a Tractor for Splitting

MAINTENANCE INSTRUCTIONS

28. Remove nine $\frac{5}{16}$ " x 1" cap screws that hold the clutch to the flywheel (See 28, Fig. 28).
29. The clutch complete together with its drive plate assembly can now be removed as a unit.

TO REASSEMBLE SPLIT TRACTOR

30. Replace clutch as a unit on clutch shaft with clutch back plate facing rear of tractor. (See 30, Fig. 28).
31. Replace clutch drive plate assembly on clutch shaft, care being taken not to damage splines, with hub facing rear of tractor. (See 31, Fig. 28).
32. Roll front end of tractor back into place, care being taken to enter end of clutch shaft squarely into pilot bearing.
33. Replace and tighten four $\frac{1}{2}$ " bolts (2 on either side of tractor). These are shown as 25, Fig. 26.
34. Working from pulley side of tractor through hand hole cover on side of clutch housing, replace and tighten four $\frac{1}{8}$ " x 1" cap screws 28, Fig. 28 which assemble clutch to flywheel. Crank shaft may be rolled over to aid in the assembly of these cap screws. (See 34, Fig. 28).
35. Remove the three $\frac{3}{8}$ " x $2\frac{1}{4}$ " cap screws 27, Fig. 28 from clutch back plate thus releasing clutch.
36. Replace and tighten the remaining five $\frac{5}{16}$ " x 1" cap screws 28, Fig. 28 which assemble clutch to flywheel.
37. Replace the remaining bolts and cap screws in transmission flange.
38. Install the remaining parts in their correct places by reversing the instructions set forth in first part of tractor splitting operations.

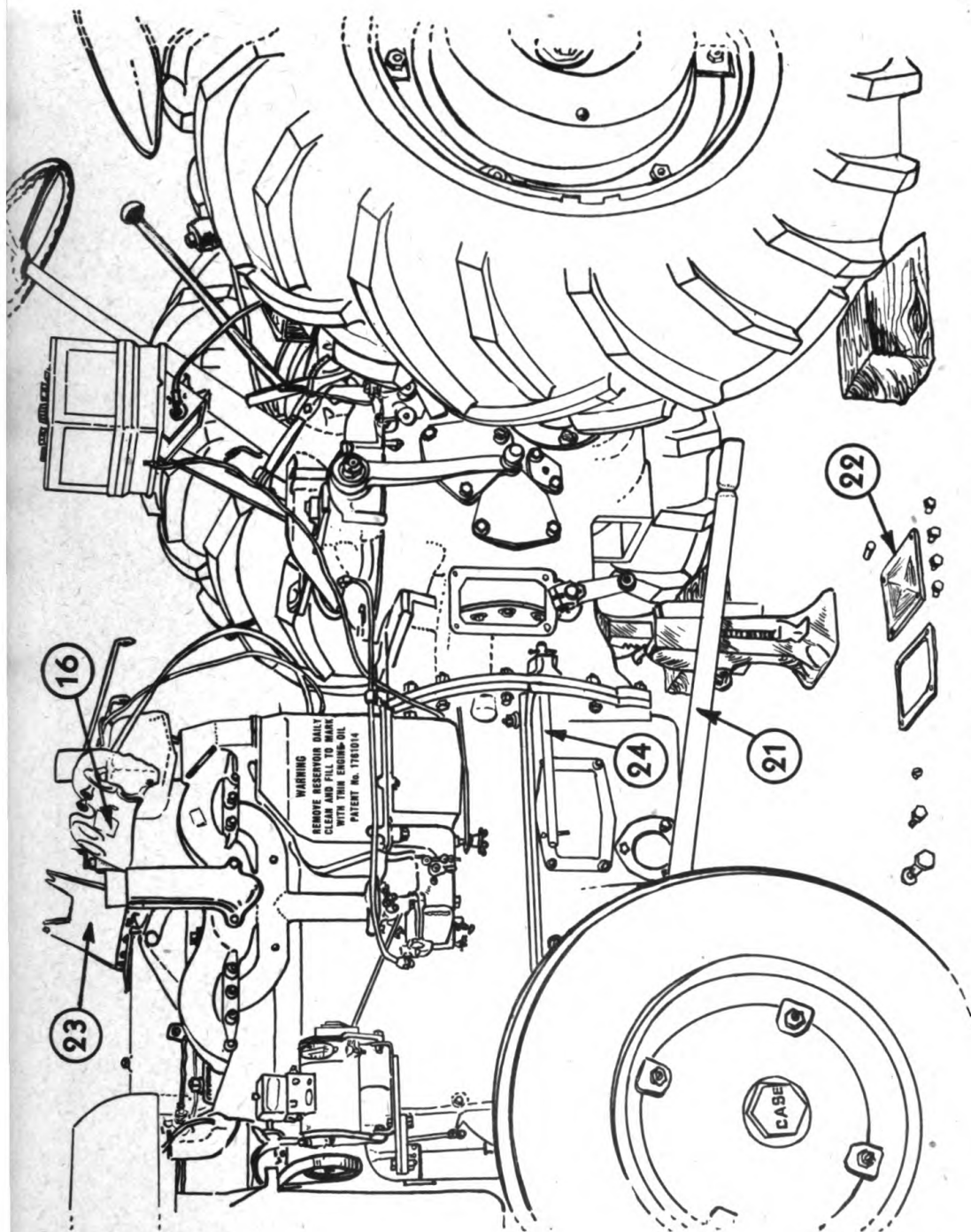


Fig. 27. Left Hand Side View—Preparing a Tractor for Splitting

MAINTENANCE INSTRUCTIONS

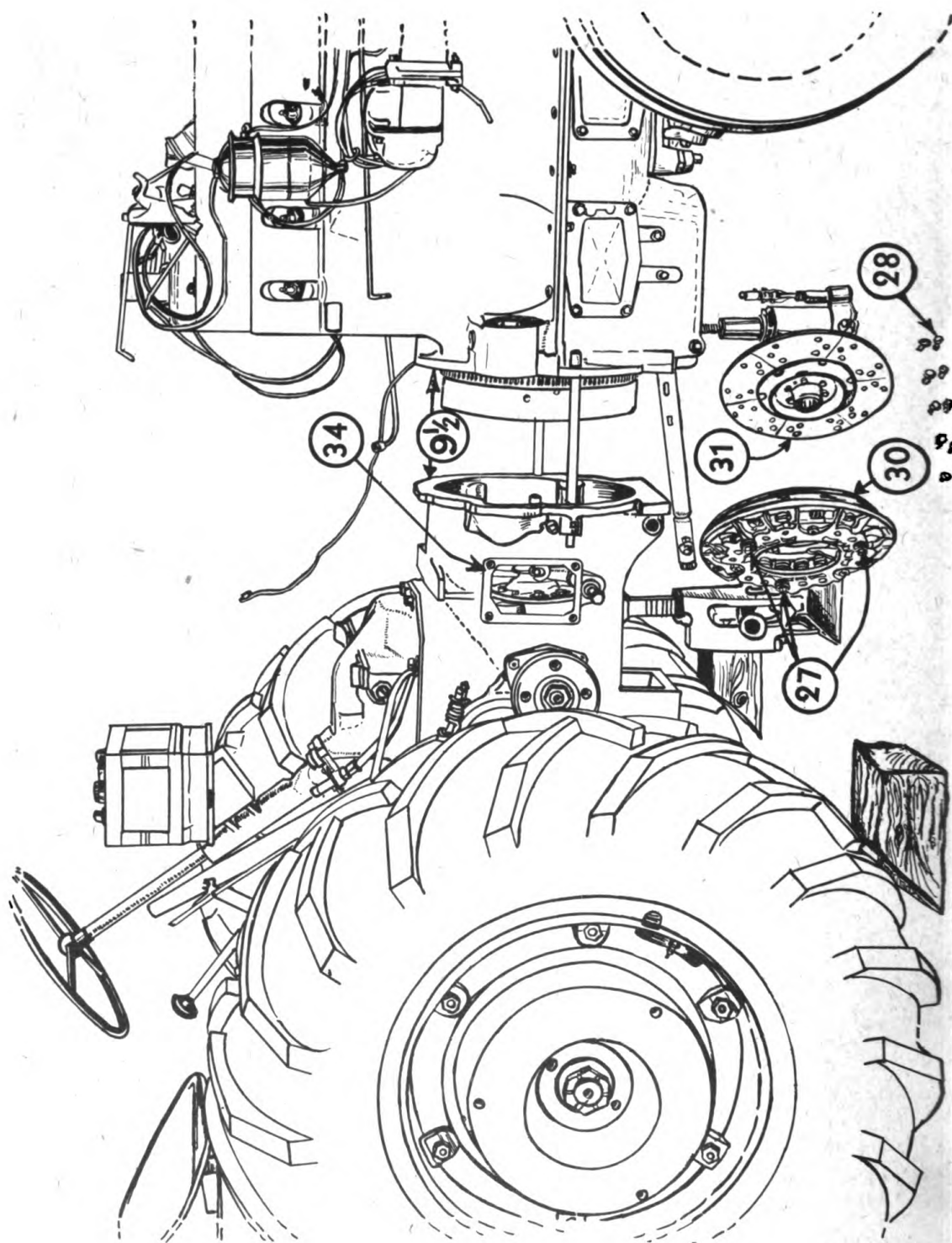


Fig. 64 Right Hand Side Showing Tractor Split with Clutch Removed

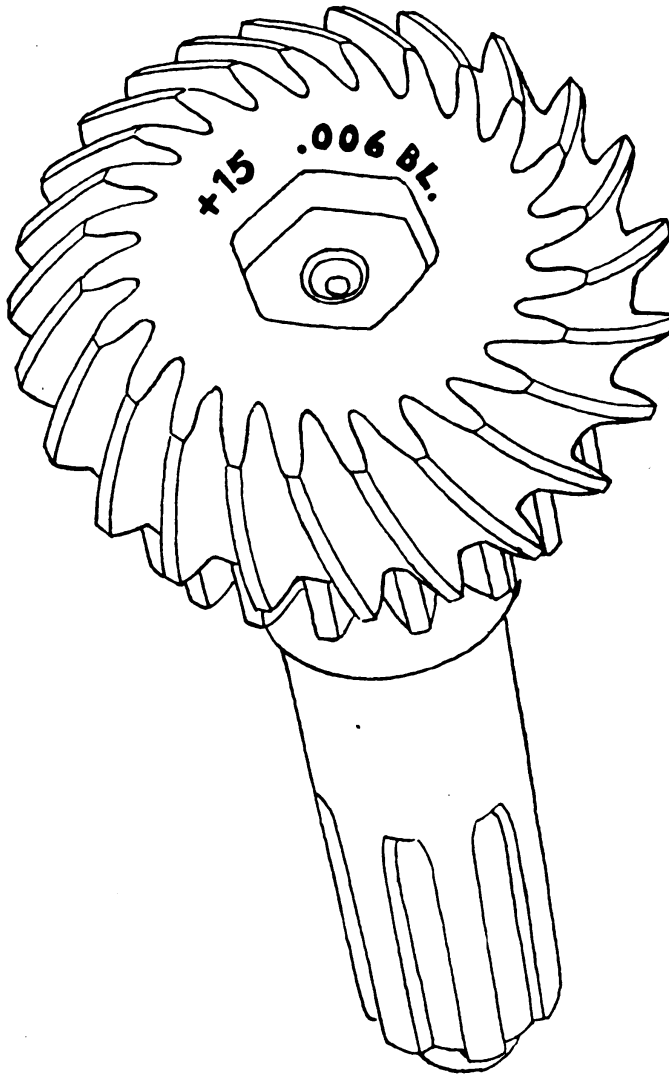


Fig. 29. Clutch Pinion

ADJUSTMENT OF SPIRAL BEVEL GEARS

The spiral bevel pinion on the clutch shaft is marked on the end for correct gauge and back lash setting of the bevel gear.

NOTE: As an example Fig. 29, shows a pinion marked + .015 as well as .006 Back Lash. Do not be confused by this and assume the pinion you are installing or adjusting in your tractor will be marked exactly as shown in this illustration. The + amount may be more or less for spacing of the pinion, and the back lash may also be more or less; on the other hand, it may be exactly as illustrated.

The end of the clutch shaft is ground flat and square with the center line, and is used to gauge the correct setting. The belt pulley shaft is also ground accurately and is used to gauge the correct setting of the spiral bevel pinion.

MAINTENANCE INSTRUCTIONS

Set the spiral bevel pinion using gauge No. 05694-AB as illustrated at 1, Fig. 30, being sure that the belt pulley shaft is mounted in place and has no end play. With gauge No. 05694-AB, use a thickness gauge or a piece of feeler stock the same thickness as is marked on the end of the pinion you are adjusting.

With the pinion properly spaced the correct distance from the pulley shaft, adjust the belt pulley shaft to the right or left by changing shims from one side to the other until you arrive at a back lash between the teeth of the spiral pinion and spiral gear equal to the amount shown as B. L. (Back Lash) on the end of the pinion.

Three thicknesses of shims, .003, .005 and .012 are used back of the bearing carriers. The shims back of the clutch shaft bearing carriers are for adjusting to the gauge setting. The shims back of the pulley shaft bearing carriers are used for adjusting the back lash and removing end play in the belt pulley shaft.

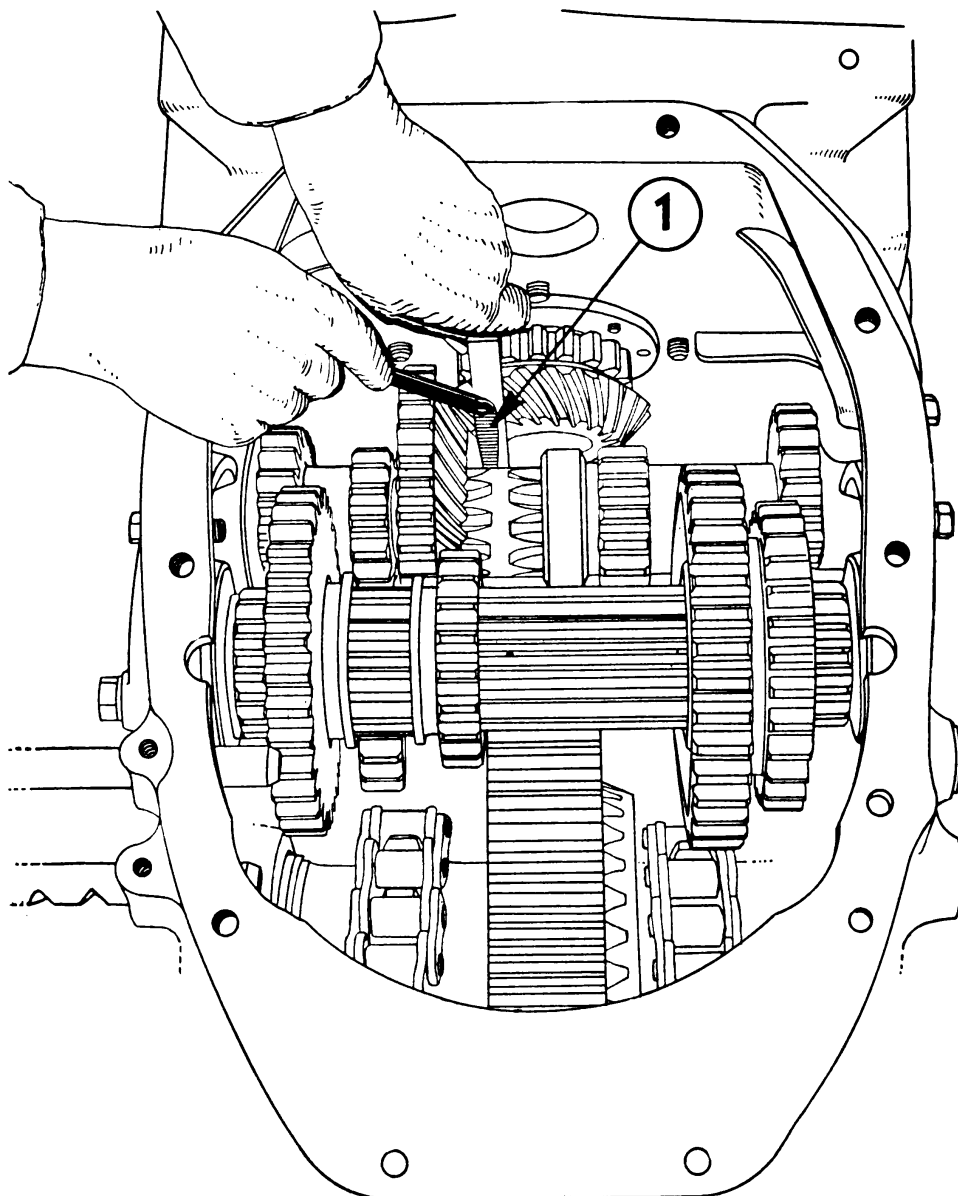


Fig. 30. Use of Gauge

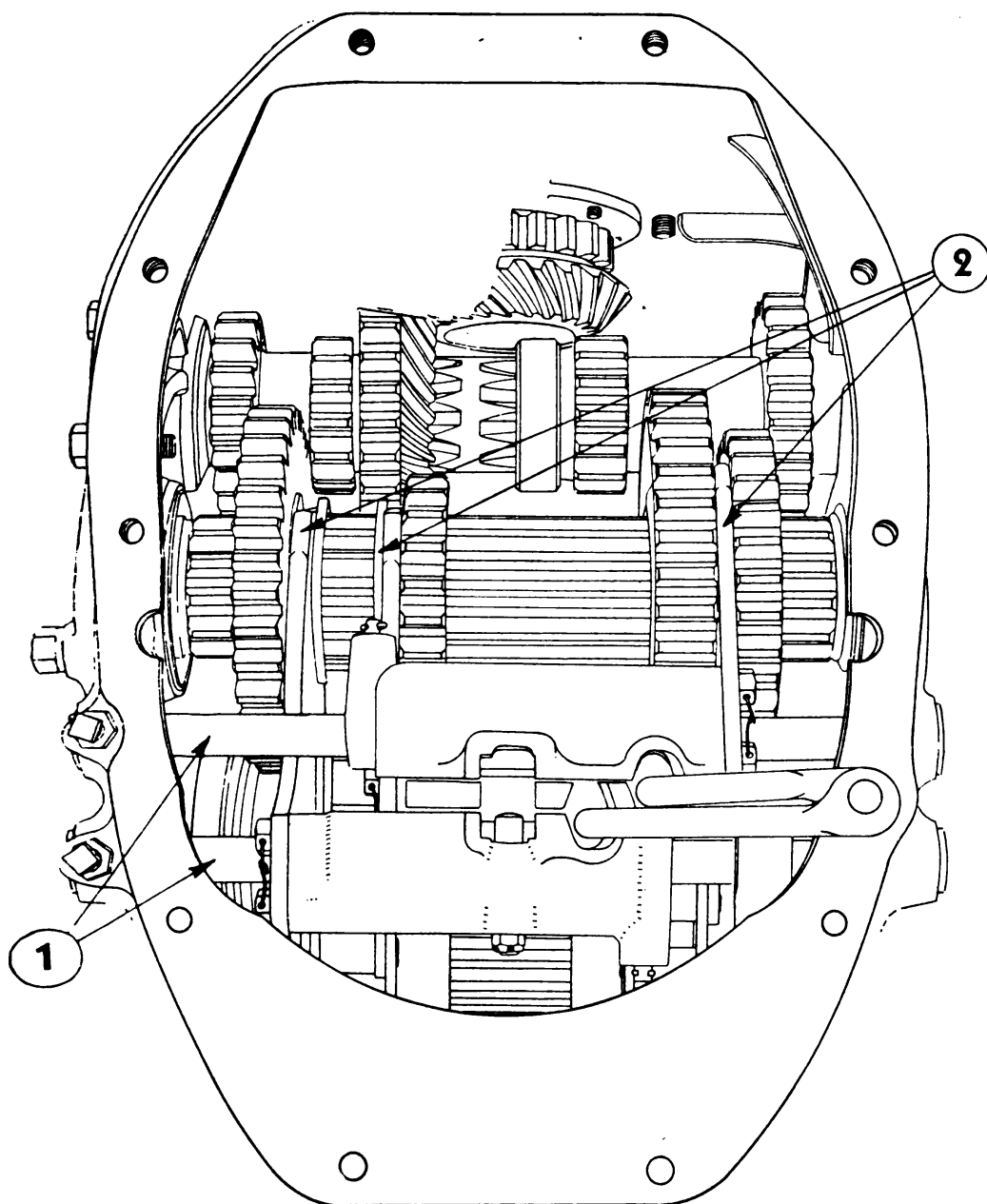


Fig. 31. Spiral Gears

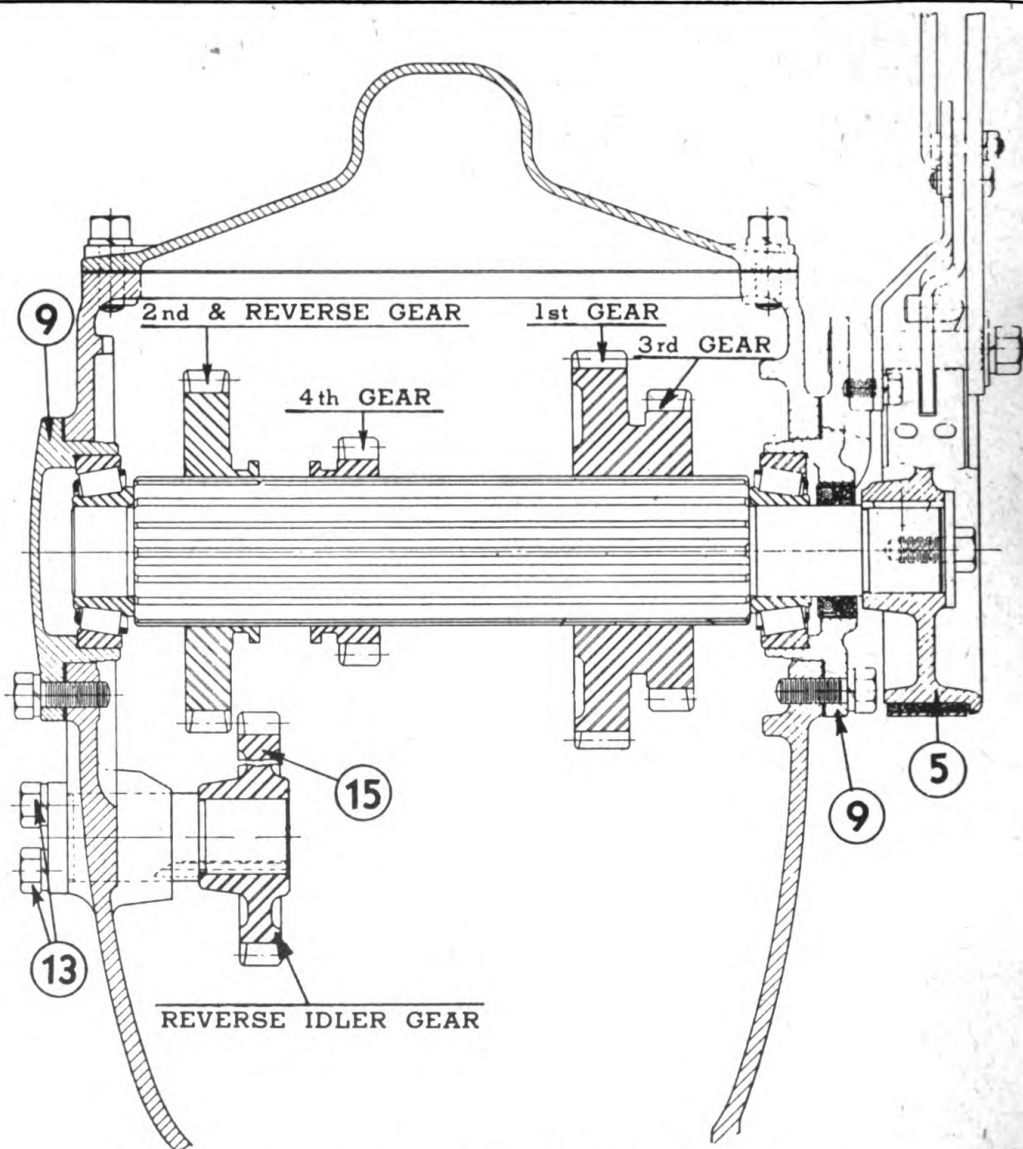


Fig. 32. Sliding Gear Shaft

SLIDING GEAR OR SECOND REDUCTION SHAFT ASSEMBLY

To remove the sliding gear shaft assembly (2nd reduction), disconnect the spark rod from the magneto and pull it to the rear of tractor. Unhook the governor rod and remove the hood from over the engine. Drain the radiator, remove the fuel tank and disconnect the radiator shutter control cable.

Remove the air breather and disconnect the heat indicator being careful not to injure the element or kink the cable while removing this unit.

Disconnect the manifold control linkage, also the oil line, at the point where it joins the engine block. On the carburetor, disconnect the choke cable and take off the fuel line between the carburetor and the fuel strainer. Disconnect the drag link from the drop arm and remove the right hand bearing carrier 9, and brake hub 5, Fig. 32.

Take off the top transmission cover and remove the shifter shafts and shifter forks shown at 1 and 2, Fig. 31, respectively.

Raise the left hand end of the sliding gear shaft and lift it out through the top of the transmission case.

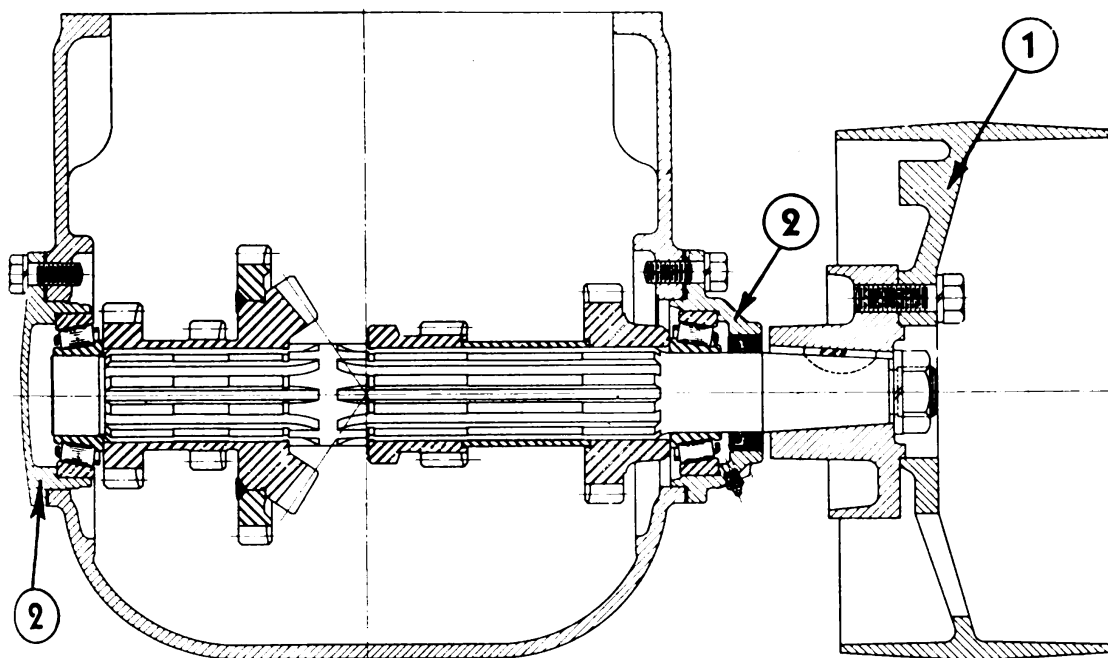


Fig. 33. Belt Pulley and Brake Shaft

12¼" Dia. 7¼" Face
Belt Pulley
Special When Ordered

TO REMOVE BELT PULLEY AND BRAKE SHAFT

NOTE: It is necessary to remove the sliding gear shaft as covered under sub-heading, "Sliding Gear or 2nd Reduction Shaft Assembly" as well as split the tractor exactly as you would for removing the clutch; this is necessary as the clutch shaft must be removed to allow clearance for the fourth speed pinion on the belt pulley shaft, when the shaft complete with all its pinions is being removed.

Remove belt pulley or brake sleeve 1, Fig. 33. Clean off the end of the belt pulley shaft before removing the right hand bearing carrier, this is to prevent the possibility of grit or dirt damaging the retainer.

Take off both bearing carriers 2, Fig. 33 keeping the shims as removed with each carrier. Remove the reverse idler gear 15, Fig. 32 by taking out the two cap screws 13, Fig. 32 on the left hand side of transmission case below the shaft bearing and removing reverse gear stud. Push the belt pulley shaft to the right as far as it will go; take hold of the left hand end of the shaft and withdraw it up through the top of the transmission case.

CAUTION: Care must be taken not to damage the oil seals when putting on the clutch shaft bearing carrier or the right hand sliding gear shaft bearing carrier. If seals are damaged, oil leaks will develop, as shafts at these locations have a machined shoulder which oil seals must pass over. It is recommended that a thimble be used at these locations. These thimbles are part of tool equipment 374-AA which can be purchased through the J. I. Case Co.

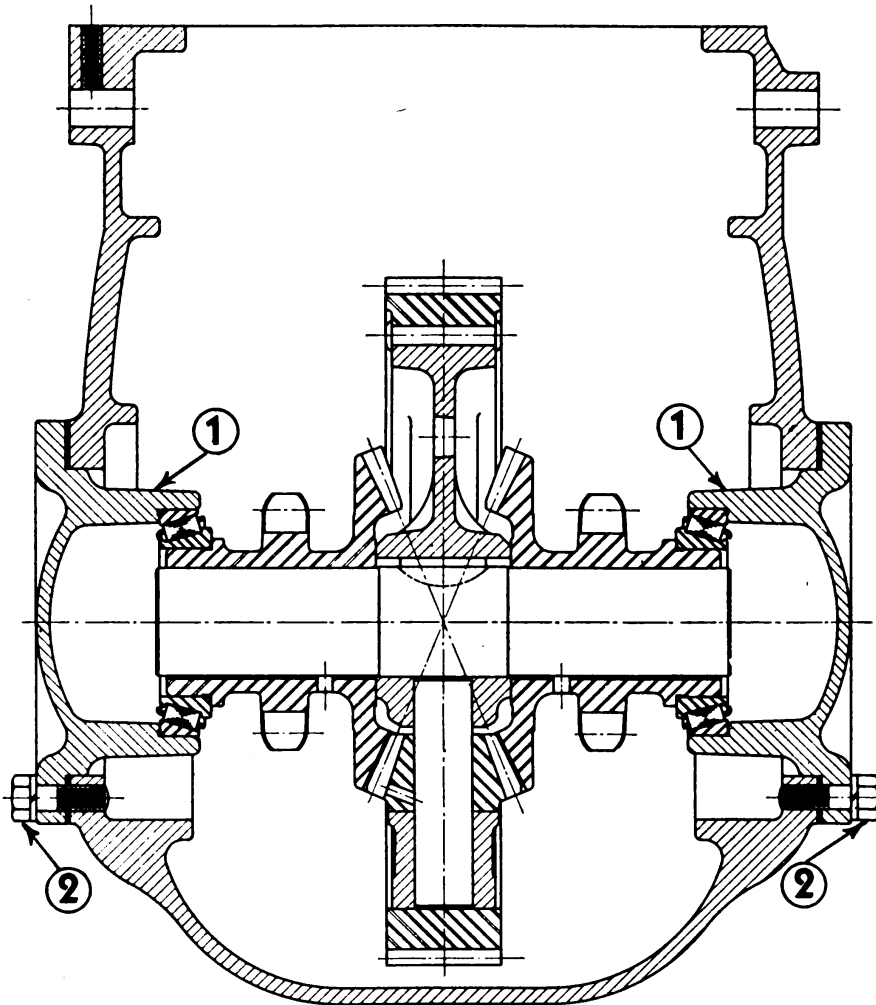


Fig. 34. Differential Shaft

TO REMOVE DIFFERENTIAL ASSEMBLY

Drain all the oil from the transmission and take off the rear transmission cover. Remove the drive chains by taking out the master link in each one. Remove differential bearing carriers (1) from each side by removing 4 cap screws, shown at 2, Fig. 34. The bearing carriers (1) with their shims should be removed from each side of the transmission case. By using a rope or sling around the differential, remove the assembly up through the top.

If wear of the gear or sprockets is noticeable, the entire assembly can be reversed end for end without changing the bearings.

Be sure to use the correct amount of shims so that the assembly turns freely, but without end play.

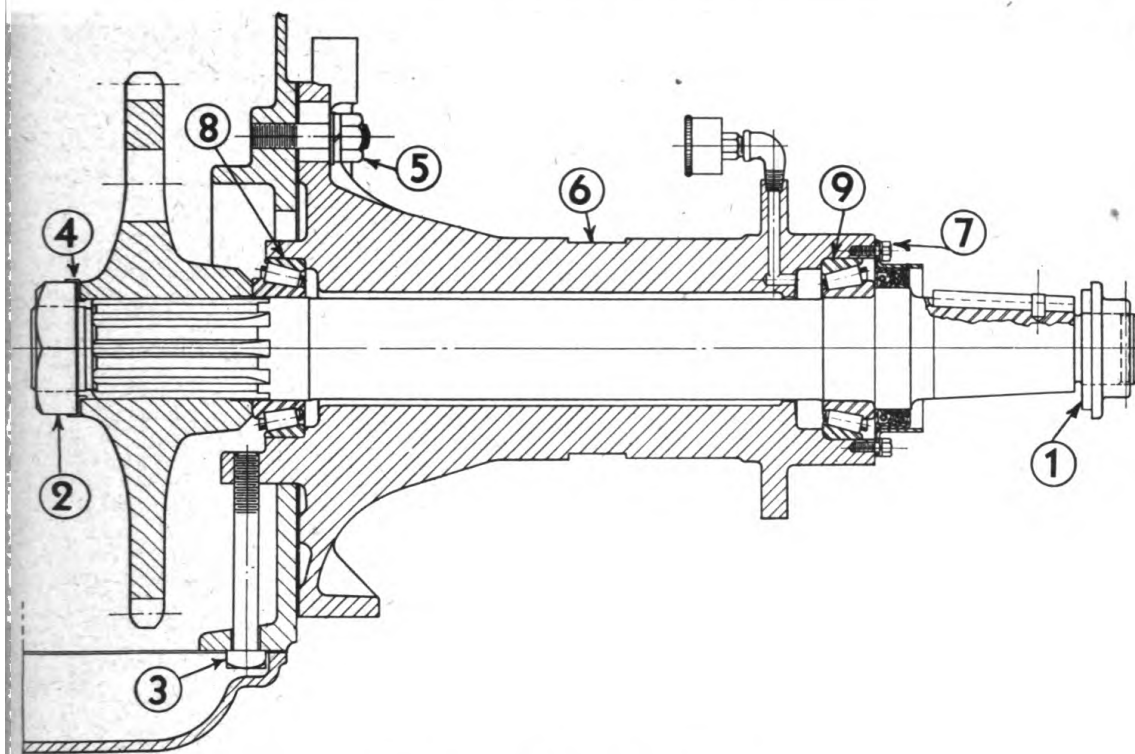


Fig. 35. Rear Axle Assembly

REAR AXLE BEARING ADJUSTMENT

The Case tractor has large, sturdy, anti-friction bearings which seldom require adjustment. However, they should be inspected periodically and if any looseness or end play is found, adjustment should be made immediately.

Before adjustments of rear axle bearings are made, a close inspection of Fig. 35 is worth while. Adjustment of the axle and wheel assembly and its relation to the adjusting nut (2) is clearly illustrated.

End play in the rear axle bearings is detected by blocking up the rear end of the tractor so that the drive wheels are free of the ground. Pry in and out on the wheel, watching for end motion, and if it is noticeable, adjust the bearings as follows:

1. Drain transmission case and block tractor securely so the drive wheels are clear of the ground.
2. Remove rear transmission cover and straighten lock washer which locks adjusting nut.
3. The axle bearing can now be adjusted by using a large wrench, with an opening of approximately $3\frac{9}{64}$ " having a handle about three feet long. The nut turns clockwise to tighten the bearing. Considerable effort may be required to turn the adjusting nut so that all end play is taken up. After tightening, make sure to bend lock washer over adjusting nut.

When proper adjustment is obtained, the axle should turn freely in its bearing, but there should be no end play. Replace the transmission cover and fill transmission to the proper level.

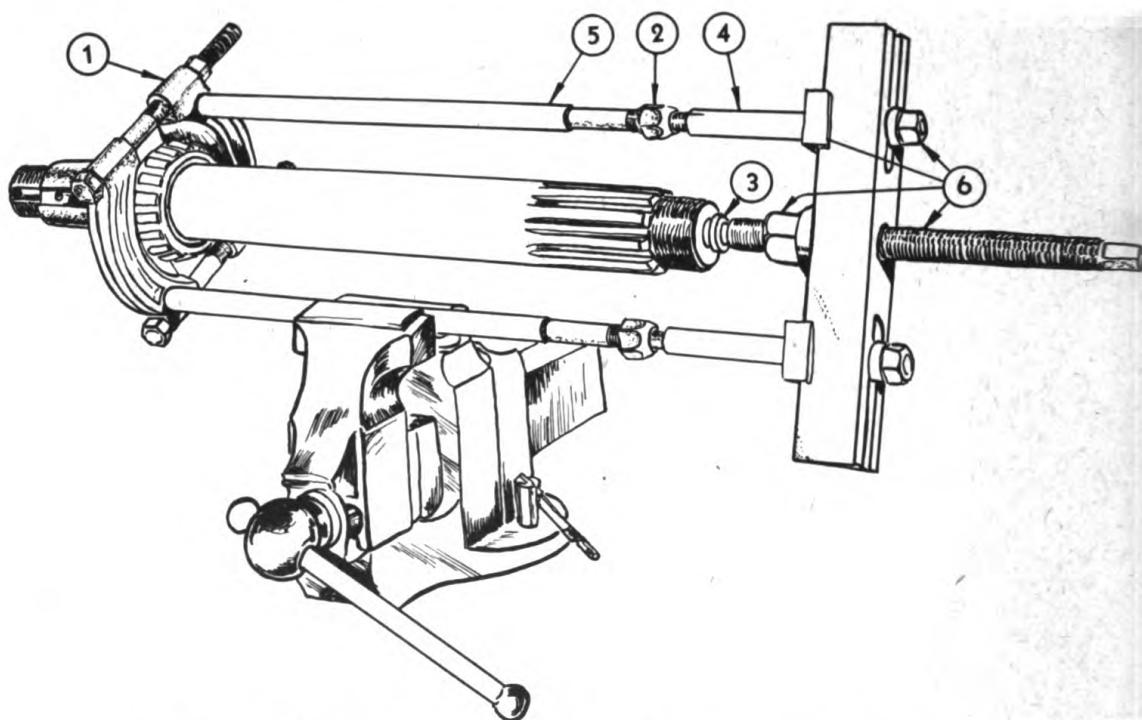


Fig. 36. Bearing Puller—Note: This puller necessary when removing rear axle outer bearing.

TO REPLACE REAR AXLE, ROLLER BEARING, OIL SEAL OR DUST GUARD

If, after a course of time, it is found necessary to replace any of the above parts, proceed as follows:

1. Drain transmission case and block tractor securely so that drive wheels are clear of ground.
2. Remove nut 1, Fig. 35 which will allow removal of the drive wheel.
3. Remove rear transmission cover, also drive chain adjusting bolt 3, which is located on the face of the transmission case end flange.
4. Disconnect the drive chain. It is not necessary to take it out, merely unwrap it from its sprocket. Use new heat-treated cotter pins in connecting links when re-assembling chain.
5. Straighten ears of washer 4, and back off nut 2 together with the washer.
6. Remove nuts and lockwashers from studs 5 allowing the removal of the axle housing 6 complete with shaft and bearings. When removing the axle housing complete with its shaft, it may be necessary to use a pinch bar to start the sprockets off the splines.
7. Remove the cap screws shown at 7. This releases the dust shield and grease retainer from the axle housing.
8. Turn nut 2 back on its threads until it is flush with the end of the shaft. This is necessary to prevent damaging the threads on the end of the shaft when driving or bumping the end of the shaft free of its inner bearing 8.

MAINTENANCE INSTRUCTIONS

9. To remove the shaft from the axle housing 6, set the assembly on end, (have the nut end of shaft down) take hold of flange end of housing and bring this assembly down firmly on a large block or solid floor with considerable force. This blow will separate shaft from its inner bearing. The shaft with its outer bearing cone, seal, felt and retainer can now be removed from its housing.
10. A bearing puller furnished by Owatonna Tool Company (consisting of the following parts) can be used to remove outer bearing 9, Fig. 35.

- 1—Fig. 36 1—952-A Bearing Pulling Attachment.
- 2—Fig. 36 2—924 Threaded Adapters $\frac{3}{4}$ N. T.
- 3—Fig. 36 1—630-3 Step Plate 1" x $1\frac{1}{4}$ ".
- 4—Fig. 36 2—930-E Push Puller Legs, $4\frac{1}{2}$ " long.
- 5—Fig. 36 2—930-B Push Puller Legs, $16\frac{1}{2}$ " long.
- 6—Fig. 36 1—938 Push Puller with 930-E— $4\frac{1}{2}$ " legs.

It is very important to have bearing pulling attachment (1) properly assembled on shaft, so as to not damage bearing.

Assemble bearing pulling attachment (1) to shaft with a small amount of clearance around shaft.

This will permit the pulling attachment (1) to fit firmly over the shoulder of the bearing inner race.

1. If it is necessary to install a new dust shield and retainer, coat the outside diameter of the retainer with gasket sealer before it is assembled in the dust shield.
2. Care must be taken when pushing a new retainer over the shoulder of the shaft; if a suitable thimble is not available use light shim stock to avoid cutting the seal.
3. When replacing outer bearing 9, Fig. 35, use care to drive it in place evenly, drive only on the shoulder of the inner race of the bearing. A pipe or heavy tube the size of the inner race of the bearing, and large enough to go over the shaft makes a very suitable driver.
4. See that all parts are clean when re-assembling and coat the bearing with a good grade of light grease or heavy oil. This will serve as lubrication for the bearings until they receive lubricant in the regular manner.
5. Use care when installing the complete axle housing not to damage its gasket, also adjust the drive chain as covered under the heading, **ADJUSTING DRIVE CHAINS**, on page 74.
5. Adjust the bearings as previously described.
7. The outer bearing should be lubricated as covered in Part I, lubrication section.

MAINTENANCE INSTRUCTIONS

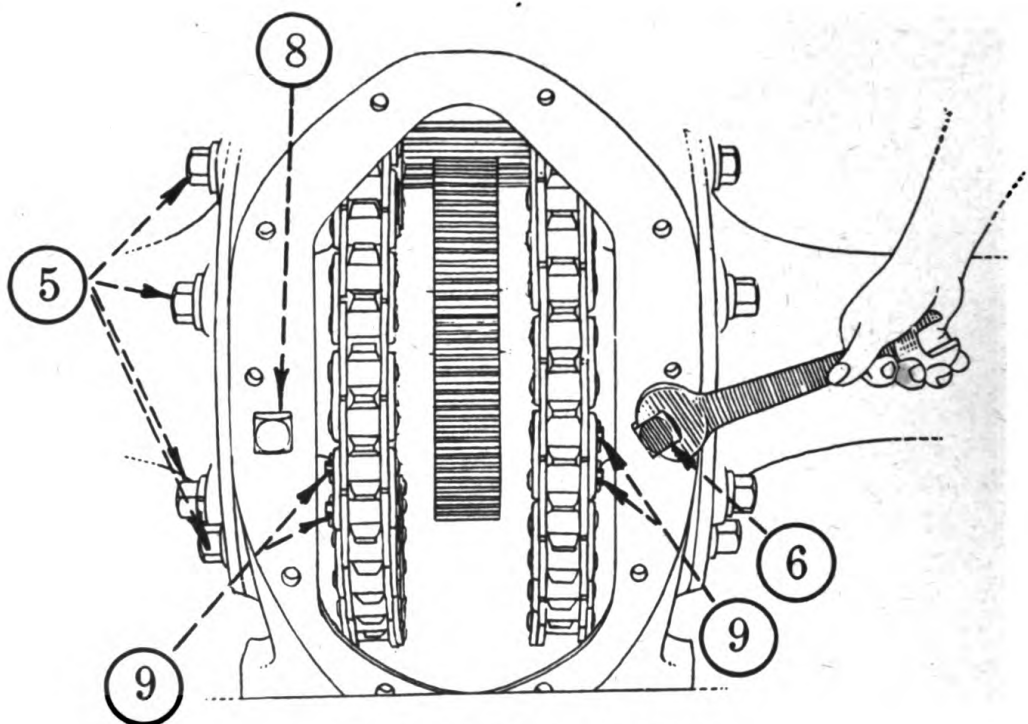


Fig. 37. Tightening Drive Chains

ADJUSTING DRIVE CHAINS

The tension of the drive chains should be inspected at least once a season. Remove the top transmission cover and observe that the chains should be tight enough so that they may be raised or lowered no less than one inch at center.

To tighten the drive chains, place a jack under the transmission case or drawbar so that the drive wheels are clear of the ground. The rear end of transmission can be raised so that the oil flows to the front of the case. Take off the rear cover of the transmission, loosen the six nuts on each side, (5) Fig. 37, which hold the rear axle housings to the transmission case so that axle housing can be shifted.

Turn the adjusting bolt (6) to the right to shift position of axle housing tightening chain. After making this adjustment, rotate rear wheel to insure that the chain is not set so tight that it will cause excessive wear on chain and bearings.

As illustrated at (8) Fig. 37, the head of adjusting bolts should be set square so that the recess in rear of the transmission cover will fit over it locking the bolt from turning.

If it is necessary to remove either chain, or both, take out the cotter pins, shown at (9) Fig. 37, and remove the master link; chain may then be removed easily. After chains have been adjusted, be sure to check brake and clutch adjustment.

NOTE: When servicing tractor chains, or any other part requiring cotter pins, never use old cotters the second time, but in all cases use new cotter pins of the "Heat Treated Special Type". If the old worn cotter pin or a new common type cotter pin is used, it would wear out in a short time allowing the chain to become disconnected, which in turn might cause considerable damage.

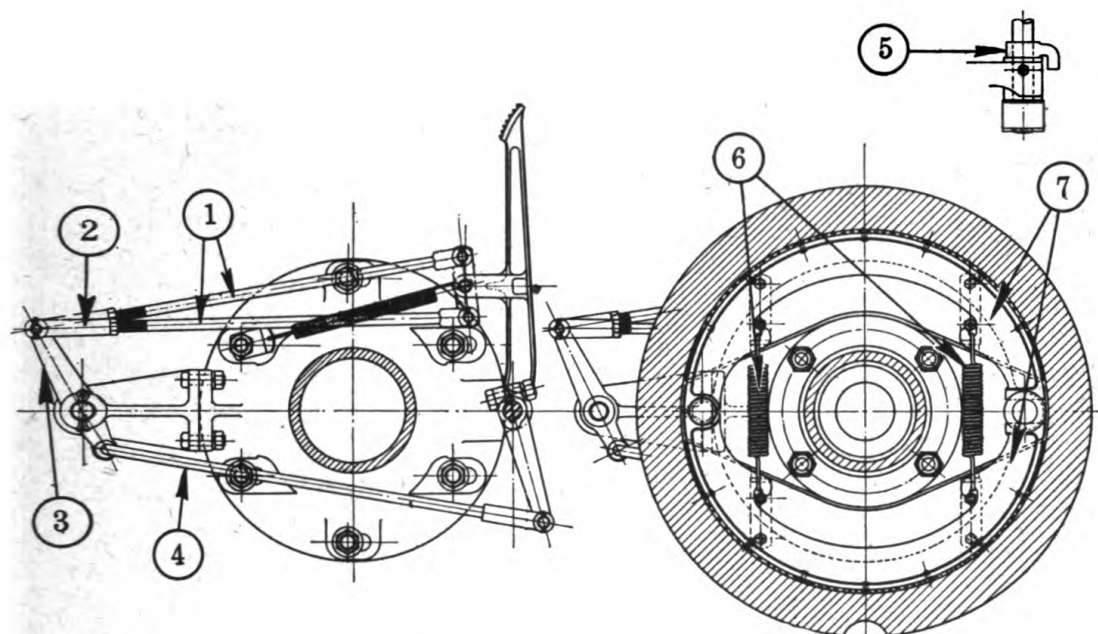


Fig. 38. Adjustment of Foot Brakes

Foot Brake.

When "DI" tractors are shipped from the factory the brakes are properly adjusted, however, they will need an occasional adjustment as the bands wear.

Before attempting to make any adjustment of the brakes, make a close study of the cut of the brake assembly, as well as, study over the instructions for adjusting them.

As the brake linings wear, the foot pedal will be depressed further before applying the brakes. Before this travel becomes so great that the foot pedal travels to the end of its guide, the rod shown as 1, Fig. 38 that connects to the equalizer bar and foot pedal should be shortened.

Adjustment.

To adjust the brakes, loosen both the right and left brake stops shown at 5, Fig. 38. Then disconnect clevises (2) from levers (3) and screw the clevises (2) further into the rods (1). When making this adjustment be careful that each rod is taken up approximately the same amount. This is necessary in order to keep the levers (3) in line or nearly so. Be sure to tighten the nuts on the rods against the clevises (2) when final adjustment is made.

If one brake applies too quickly, it will be necessary to lengthen either right or left hand brake rod (4) depending on which brake applies too quickly. In other words, if the right hand brake applies too quickly, lengthen right hand brake rod (4) a little, where on the other hand, if the left hand brake applies too quickly lengthen this same rod which is on left hand and is not shown in this cut.

With the brakes properly adjusted, the foot lever should rest against the end of its guide which acts as a stop, and at the same time the right and left hand stop shown as (5) should be adjusted to bear against the brake bracket.

TO REPLACE BRAKE LINING

1. Remove both shields.
2. Remove springs.
3. Remove 4 bolts holding bracket for rear wheel brake.
4. Replace new lining on brake shoe and replace same in their correct position. Be sure that bearings are adjusted properly when replacing wheel.

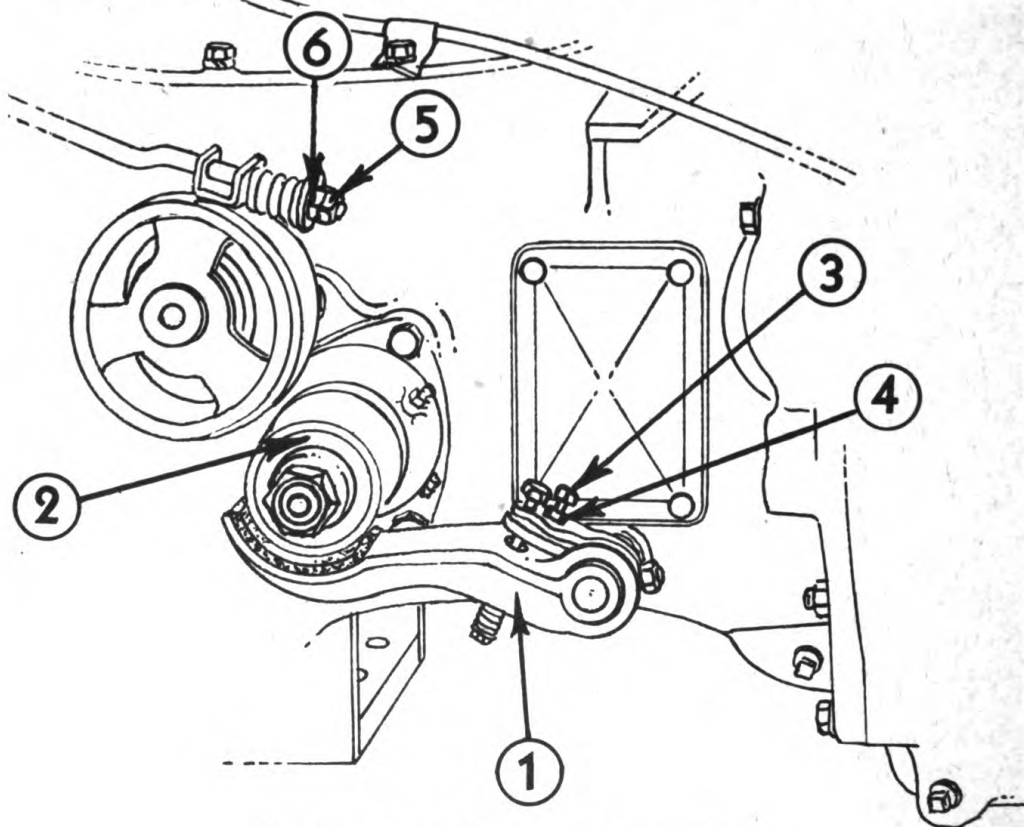


Fig. 39. Clutch Brake and Hand Brake

CLUTCH BRAKE

Following clutch adjustment, inspect clutch brake shoe 1, Fig. 39 to insure that it contacts the clutch brake sleeve (2) when the clutch is disengaged. Adjustment of the clutch brake shoe (1) is very simple. When clutch is engaged be sure that brake shoe does not make contact with clutch brake sleeve (2). This adjustment can be made by adjusting screw (3). Turning adjusting screw (3) to the right increases the clearance. When clutch is engaged this clearance should be $\frac{1}{8}$ inch. Lock adjustment securely by tightening nut (4).

HAND BRAKE

Shifting gears while tractor is on a hill can be accomplished if hand brake is firmly applied. To adjust brake:

1. Loosen lock nut 5, Fig. 39.
2. With brake lever in released position, set adjusting nut (6) so that the lining does not cause any drag on the drum.

Tighten lock nut (5) after adjustment is made.

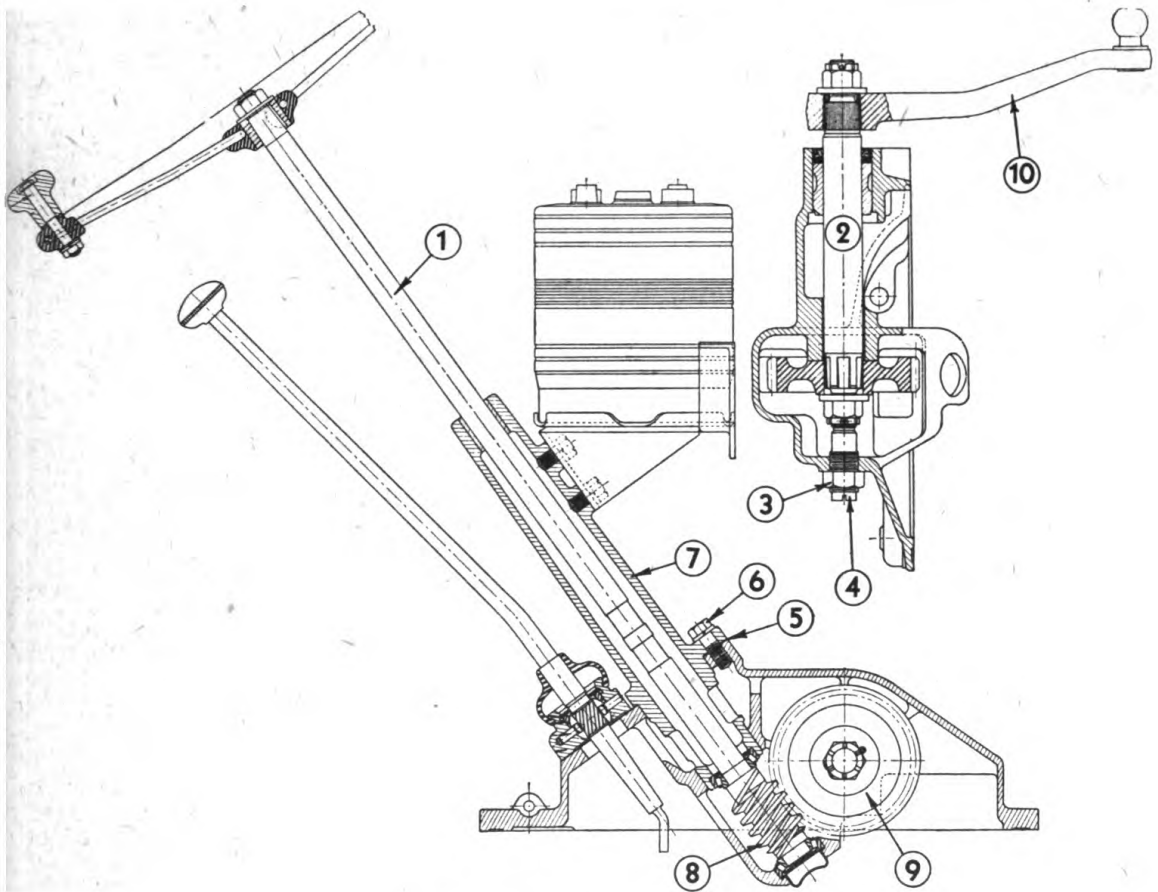


Fig. 40. Steering Gear

STEERING GEAR ADJUSTMENT (Fig. 40)

End play of steering arm shaft (2) is taken up by loosening lock nut (3). Then make the proper adjustments on adjusting screw (4). It is very important that lock nut (3) be securely tightened after the proper adjustment has been made. Any excessive end play in steering column (1) can be taken up by removing one or more shims shown at (5). To remove these shims it is necessary to first remove the battery as well as the three cap screws shown at (6). Care must be taken when removing the steering column (7) complete with its shaft (1). When replacing this steering column and shaft, extreme care must be taken or the Timken cage at bottom of steering column worm may be damaged when assembling. If, after long service, excessive back lash is found between steering worm (8) and steering worm wheel (9). Take up back lash by removing steering arm (10) and rotating steering shaft (2) one third revolution. This operation presents new working surfaces between steering worm (8) and steering wheel (9).

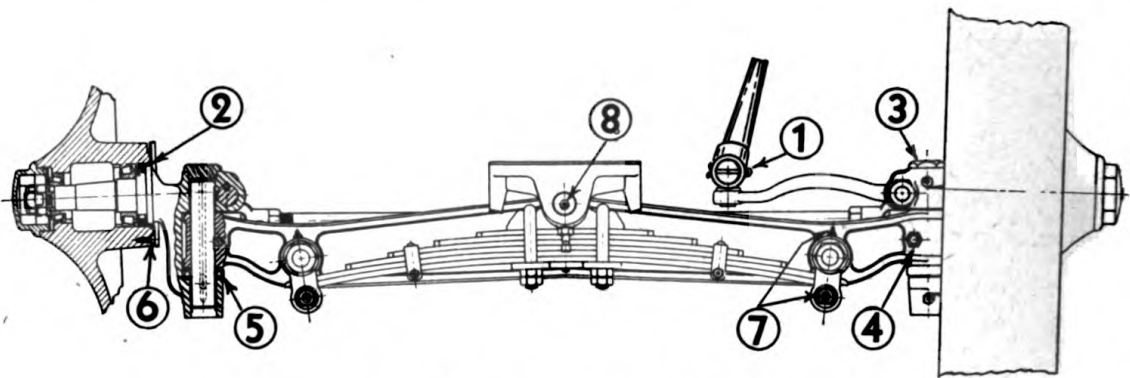


Fig. 41. Front Axle Steering Spindle and Drag Link

STEERING SPINDLE AND DRAG LINK

To take up lost motion due to wear in drag link, remove cotter pin 1, Fig. 41, and turn cap to the right and relock with cotter pin.

The dust shield (2) and the gasket (6) back of it should be in place on each front wheel as shown to prevent dirt from working into wheel bearings.

Refer to page 14 for instructions on oiling of king pins.

Refer to page 14 for lubrication of drag link.

Refer to page 14 for lubrication of tie rod yoke end pins. If tie rod is removed, care should be taken in replacing to adjust so that front wheels gather or "toe-in" slightly. The front wheels should be $\frac{1}{4}$ " closer together at front than at the rear, measured at height of hub and at the rim of wheels.

The king pin is clamped from turning by use of a threaded tapered pin (4). If necessary to remove king pin, the tapered pin must first be removed. The caps (3) on top and bottom of knuckle should be removed to allow driving out the king pin.

When king pin is driven out, the spindle and thrust bearing (5), Fig. 41, can be removed.

In assembling, make sure that the thrust bearing is in place at lower end of the king pin hole.

If bushings are badly worn, they can be driven out of spindle and new ones pressed in.

Refer to page 15 for lubrication of spring shackles (7).

Refer to page 14 for lubrication of front axle pivot pin (8).

Power Take-Off Guard

Case tractors are equipped with a standard power take-off adapter guard which shields the tractor end of the power take-off shaft. This guard provides a standardized attaching point for the shields furnished with each driven machine, whether made by CASE or some other company. Whenever a power take-off driven machine is in operation, these guards and shields must be in place to prevent injury to the operator. When the power take-off is not in use, the small tube-like guard around the power take-off spline should be in place to prevent clothing from being caught in the spline. The standard adapter guard on the rear of transmission cover should never be removed at any time.

Power Take-Off

The "DI" Series Tractor is furnished with an A. S. A. E. standard $1\frac{3}{8}$ " power take-off spline. The power take-off shaft is put into operation by meshing the power take-off gear clutch 13 Fig 42 with the power take-off gear 15. This is accomplished by pushing the power take-off shifter, shown as 8 Fig. 3 toward the instrument panel with the clutch disengaged. The power take-off is stopped and started by means of the main tractor clutch. At the normal full load engine speed of 1200 R. P. M. the power take-off shaft speed is 540 R. P. M.

The power take-off shaft is disengaged by pulling the power take-off shifter rearward. Whenever the power take-off is not being used, disengage this shifter.

Before the tractor is used to pull and operate a power driven machine, make a careful study of the power take-off drive to see that it is properly connected.

The length of the power take-off shaft should be determined by trial. Turn the tractor slowly holding the shaft outside the tube, watching to see where the end of the shaft comes when turning as short as possible. If it is seen that the shaft will hit the universal fork, it must be cut off enough to clear about one inch. Likewise, the tube must clear the hub of the universal joint at the opposite end by at least one inch. With the shaft and tube the proper length for turning, check them carefully in the straight ahead position to see that the shaft extends into the tube sufficiently to provide a satisfactory driving connection.

If the lengths of the shaft and slip tube are not correct for the hitch being used, the shaft may come out of the tube and before the tractor could be stopped, considerable damage might be done to the machine, and possibly serious injury to the operator.

On assembling the telescoping drive shaft insure that the universal joint forks on the square shaft are in the same plane as the forks on the square tube. In other words the two forks closest together should be assembled in the same plane, and the two outer forks likewise in the same plane, at 90° to the first. If this is not done, excessive vibration of the driven machinery will result, as uniform torque will not be transmitted through the power take-off shaft when the universal joints are operated at an angle.

MAINTENANCE INSTRUCTIONS

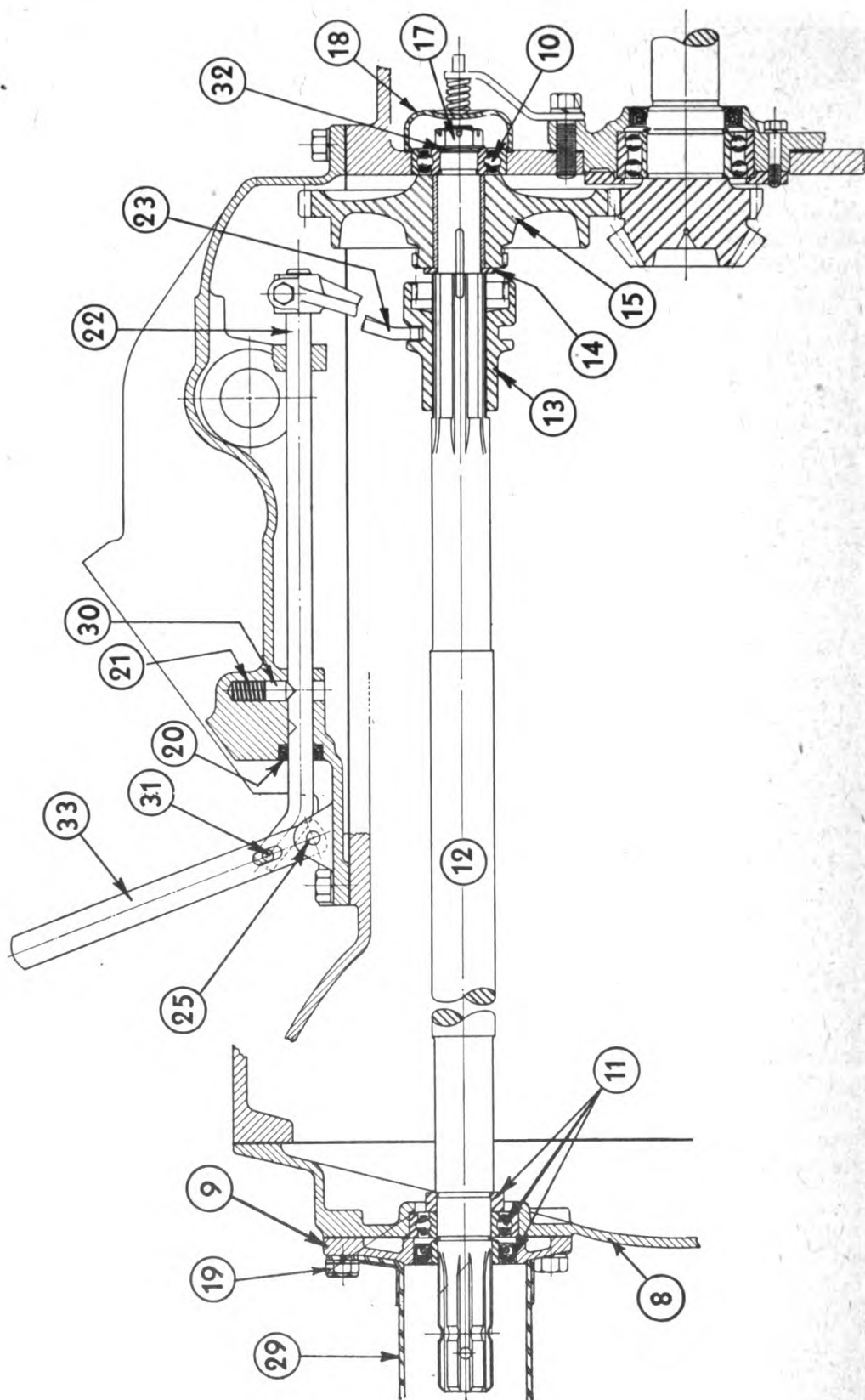


Fig. 42. Power Take-off

For power take-off driven machinery other than CASE, make a close study of the manual furnished with the machine. Very often long shafts and tubes are furnished. In such cases it is necessary to cut both the shaft and the tube to the correct length.

TO INSTALL POWER TAKE-OFF (See Fig. 42)

Power take-off is driven from the clutch shaft through spur gears. The spline end is $1\frac{3}{8}$ " A.S.A.E. standard and its height above the center line of the rear axle is $5\frac{1}{4}$ ". P-T-O rotation is clockwise when viewed from the rear end of the tractor.

To install, drain the transmission oil and remove the rear transmission cover shown at (8) Fig. 42. Scrape the old gasket surface clean, assemble new gasket and transmission cover.

Disconnect the drag link from the steering drop arm. Take off the hood and disconnect the shutter control rod.

Remove the spark and throttle rods at engine block and the air breather.

Disconnect the heat indicator at the radiator elbow and wrap the cable around the steering apparatus, being careful not to damage the element or kink the cable during the procedure.

Disconnect the choke rod, oil pressure gauge line.

Remove the fuel line from the strainer to the rear end of the tank and disconnect the line at the strainer leading to the carburetor; remove the fuel tank.

Take off the left hand inspection plate from the clutch housing. Remove the top transmission cover.

Put ball bearing (10) Fig. 42, in front end of transmission case. Place collar, bearing and spacer (11) on large end of power take-off shaft. Place shaft (12) in transmission case until small end is over the bevel pinion on the clutch shaft. Slip gear clutch (13) over end of shaft and on the splines as shown. Put on thrust washer (14), Fig. 42, making sure that rounded edge of washer is toward the spline on the shaft. Put on the drive gear shown at (15). Drive the shaft (12) into the front bearing (10), making sure that the bearing is up against the shoulder on the shaft.

Mark the end of the shaft to show the location of the cotter pin hole. Assemble washer (32) and tighten nut (17) to hold bearing snug on shaft. Put in the cotter pin and spread it. Put on steel cover (18) using the provided gasket to make an oil tight joint. Put on the transmission rear end cover cap (9) using the four cap screws (19). Remove steel plug from hole (20), Fig. 42, in the front of the top transmission cover and assemble oil seal in this location.

Turn the top transmission cover over and insert spring (21) and plunger (30) making sure that the plunger rests in the front groove when the shifter shaft (22) is assembled. Be sure that shifter fork (23) is engaged with slip gear clutch (13). Assemble lever (33) over pin (31) and fasten lever (33) in place by driving in pin (25).

Replace the fuel tank and connect up the drag link. Connect the spark and throttle rods, shutter control cable, heat indicator, choke rod, oil pressure gauge line, manifold control and the fuel line.

When power take-off is connected to power driven machinery, it will be necessary to remove the spline shaft guard shown at (29). **When this guard**

is removed, make sure that the adapter power take-off guard is installed and properly connected to the telescoping shield which should be furnished with all power take-off machines.

If power driven machines are received without the required telescoping safety shields, contact the factory immediately, providing the machine is of Case manufacture; if the machine is of some other make see their nearest representative. Also make sure that your tractor, when equipped with power take-off, is provided with the above mentioned adapter guard.

Static Electricity

When operating a fully rubber tire equipped tractor either on the belt or in the field, a light chain should be fastened to the drawbar or other suitable metal part of the tractor and sufficiently long for the other end to touch the ground. By the use of such a chain, all danger of static electricity will be overcome. If tractor is operated without some proper ground there is danger of fire being started from the static discharge.

Tire Pump

The pump furnished with this tractor is purchased from G. H. Miser, Co., 327 East Marquette Road, Chicago, Illinois and carried under the trade name of "Enginair". This pump is furnished with an 18 mm. fitting which fits any one of the spark plug holes. To operate this pump proceed as follows:

Remove the one spark plug and install the Enginair pump in its place. Press the other end over the tire valve and the engine does the rest. The compression of the engine piston actuates the Enginair, which in turn pumps only cool, clean air.

THE COMPLETE OBSERVANCE of one simple rule would prevent many thousand serious injuries each year. THAT RULE IS: "NEVER ATTEMPT TO CLEAN, OIL, OR ADJUST A MACHINE WHILE IN MOTION."

—National Safety Council.

RUBBER TIRES

When rubber tire equipped tractors leave the factory, all tires are inflated to a pressure of from 25 to 30 pounds. This is done to prevent bouncing of the tractor in shipment.

Before using tractor, check all tire inflations and see that the front wheel tires have 28 pounds pressure and the rear wheel tires have 12 pounds pressure; If wheel weights are used or heavy loads are carried on the tractor, the air pressure must be increased accordingly. The following table indicates the pressure recommendations under typical load conditions. It is not recommended to load your wheels beyond the limits listed in the center column for the size tire on your tractor.

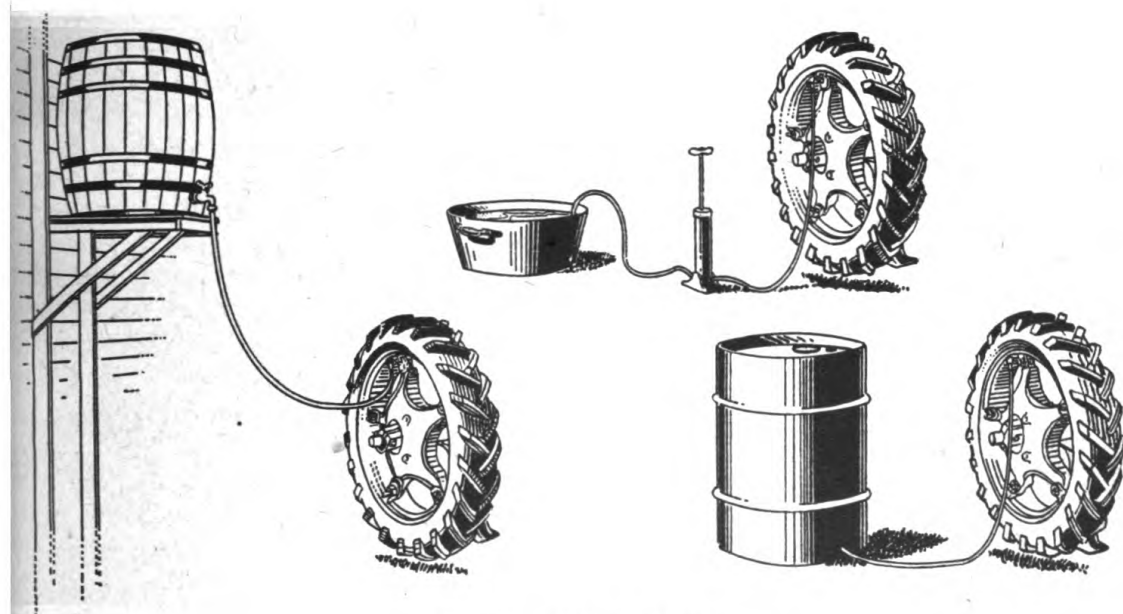


Fig. 43. Filling Tires

AMOUNT OF WATER AND CALCIUM CHLORIDE TO FILL EACH TIRE THREE-FOURTHS FULL

Tire Size	WATER ONLY		CALCIUM CHLORIDE ANTI-FREEZE SOLUTION					
			SAFE FROM FREEZING TO 20° BELOW ZERO			SAFE FROM FREEZING TO 40° BELOW ZERO		
			Gallons Water	Pounds* Calcium Chloride	Weight of Mix	Gallons Water	Pounds* Calcium Chloride	Weight of Mix
12.00x24	30	250	27.5	56.9	285	25.5	90.6	303
6.00x16	5.76	48	5.3	10.9	55	4.9	17.4	58

*A heaping quart of Flake Calcium Chloride weighs approximately two pounds.

MAINTENANCE INSTRUCTIONS

CARE OF TIRES

To obtain the greatest amount of service from tires, one should be sure they are not subjected to excessive deterioration from abuse or neglect. There are only a few simple rules to follow in this connection.

1. Maintain the inflation pressures specified in the preceding table.
2. Keep valve caps on all valve stems.
3. Repair any cuts or breaks in the casing promptly to prevent damage from water, dirt, or weakened fabric.

Normal air pressure in the rear tires is 12 pounds, except when wheel weights or water are added to secure adequate traction. If the tire is operated at 10 pounds pressure (only 2 lbs. under normal, but actually 17% under inflated) the tire may buckle when subjected to heavy drawbar loads. Buckling will quickly ruin the casing, requiring an excessive replacement expense. In addition lower inflation pressures will not materially increase traction, and may permit slippage between casing and rim on heavy drawbar loads, resulting in damage to the valve stem.

Therefore, maintain your inflation pressures specified in the preceding table. Check the pressures with an accurate gauge every other week unless you find that under your own individual operating conditions the pressure will be maintained for longer periods. Inflation pressures decrease when the tractor is idle as well as when it is operating, so be sure to recheck the pressures after the tractor has been inactive for some time.

It is far more expensive to operate tractors with under inflated tires than it is to operate the average motor vehicle with the pressures too low.

The valve caps perform an important function in maintaining proper inflation pressures. They serve two main purposes:

1. Sealing the valve stem against entrance of dirt, which will be forced into the valve mechanism and inner tube when the tire is inflated the next time.
2. Preventing leakage of air past the valve. This leakage is accentuated by dirt or other foreign matter which may accumulate on the valve seat because of the absence of the valve cap.

Protect your tires by keeping the valve caps on all valve stems at all times (except when checking pressure or inflating). These caps seal the dirt out and the air in.

Injuries to the casing, such as cuts and breaks, should be repaired promptly to prevent excessive deterioration of the cord structure, which may result in complete failure or expensive repairs. Small cuts in the sidewall or tread rubber, exposing the fabric, should be washed out with gasoline and filled with tread cut repair gum. This will prevent moisture and dirt from working into the fabric. If the tire is punctured by a large nail or similar object, a regular rubber plug may be inserted from the inside, at the time the tube is repaired. Any more serious injuries may best be handled by a reliable service shop.

After mounting rear casings on the rim, the tire should be inflated to approximately 30 pounds to insure positive seating of the tire bead. Then the pressure should be decreased to the specified amount for normal operation.

Wheel Weights

Under some conditions a certain amount of slippage will be experienced when using a rubber tired tractor to pull heavy loads. Your CASE Model "DI" Series Tractor has been designed with sufficient weight to handle all average loads under usual conditions. Under exceptional conditions which produce excessive slippage, weight can be added in two ways.

The first method is to attach cast iron weights to the wheels. Weights for the rear wheels are available under No. 5145A. Each set consists of two weights adding 150 pounds to each wheel.

The second method to add weight involves partially filling the tires with water.

Either one of these methods is satisfactory. Whichever one is used, it is desirable to have the weight in the wheels only when heavy work is being done. Operating your tractor with unnecessary weight merely consumes more fuel and throws a greater load on the gears, shafts and bearings.

Cast iron wheel weights are preferred by many operators to using water in tires, chiefly due to the greater ease of installation and removal, but in many cases, water is used because of its low cost.

Water will work satisfactorily if certain precautions are taken. Whenever freezing weather is to be experienced, it is necessary either to drain the tires of their water or to use an anti-freeze solution to prevent ice damaging the tires. The tractor should not be operated with ice inside the tires, as the sharp corners of the ice will cut the inner tube. At no time should the tires be filled more than $\frac{3}{4}$ full with water, which is determined by rotating the tire so that the valve stem is at the top of the wheel.

If there is no danger of freezing you can fill your tires with water direct from a hose connected to a pressure water system. Secure an adapter from the CASE CO. which will permit connecting your hose directly to the tire valve.

If the tractor has been operated during the summer months with water in the tires, the water must be removed before freezing weather is encountered. To remove the water, turn wheel so that the valve is on the bottom, and remove the valve core; the weight of the tractor and the remaining air pressure will force most of the water out of the valve. It may be necessary to add air to the tire to cause all the water to drain out; and in any case air pressure will speed up the process. A slight amount of water will remain in the tire, and to prevent damage to the tube from the sharp corners of ice particles, a quart or two of either alcohol or calcium chloride solution should be added.

When calcium chloride solution has been employed, it may be desirable to save the solution for re-use. Draining this solution from tires (to reduce weight) is the same as noted in the previous paragraph, except that a hose should be used to direct the solution into a suitable container.

If you plan to have liquid in your tires during freezing weather, you can protect your tires by using a calcium chloride solution. The appended table gives information on the amount of calcium chloride necessary to use in the tires. Calcium chloride can be purchased from dealers who handle builders supplies.

The solution should be made by pouring calcium chloride slowly into the proper amount of water; never pour the water over the calcium chloride crystals.

The easiest method of putting calcium chloride solution into a tire is by means of a small hand force pump which you may already have or which you may purchase from your dealer. The only special feature is that the hose must have a connector to fit the regular tire valve. Another method of filling the tire is by syphoning from a tank placed eight or ten feet above the tire to be filled.

MEMORANDUM

Original from
UNIVERSITY OF CALIFORNIA

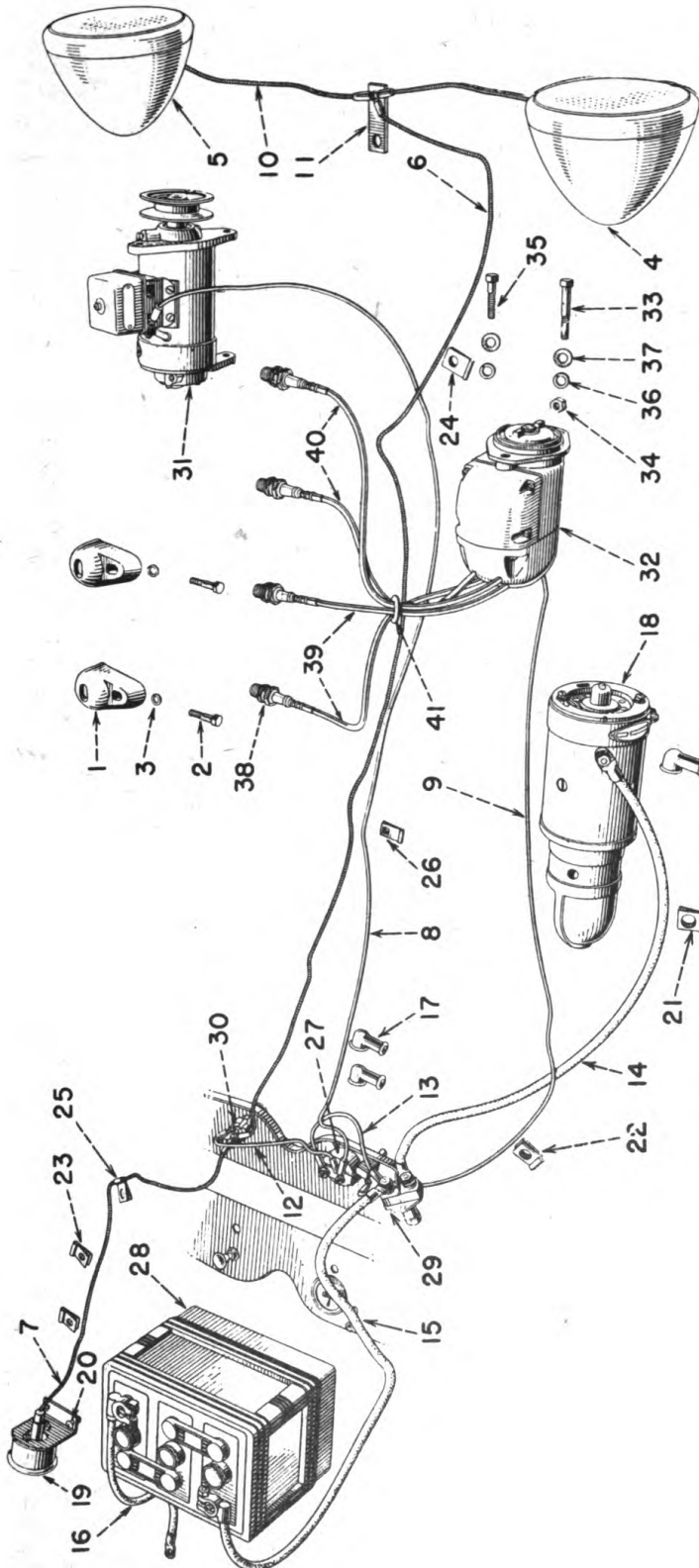


Fig. 44. Electric Lighting and Starting Equipment.

ELECTRIC LIGHTING AND STARTING EQUIPMENT

(Refer to Figure 44)

Referring to the battery (28), the ground cable (16) is attached to the negative terminal. Cable (15) leads from the positive terminal to the starting switch (29). Cable (14) extends from the switch to the starting motor (18). Wire (13) connects the starting switch to the discharge side of the ammeter (27).

Wire (8) runs from the charged side of the ammeter to the generator (31).

Wire (12) extends from the charged side of the ammeter to the light switch (30). From the light switch, wire (7) leads to the tail lamp (19), and wire (6) runs to the front junction wire (10), which connects the two head lamps (4) and (5). The head lamps are mounted on head lamp brackets (1), which are fastened to the radiator by two $\frac{3}{8}$ " x $1\frac{3}{4}$ " hex. head cap screws (2).

Wire (9) leads from the magneto (32) to a ground switch on the instrument panel. The short wires (39) run from the magneto to No. 3 and No. 4 spark plugs, and the long wires (40) run from the magneto to No. 1 and No. 2 spark plugs.

(Refer to pages 89-92 for the information on maintenance of electrical equipment.)

Note:

In reviewing figures 44 and 45 it will be noted that both views show head lights mounted on the radiator, whereas, some tractors were furnished with the headlights mounted on a support fastened to the battery mounting. The lead wires however, go to the headlights in a very similar manner as is shown in figures 44 and 45.

The hour meter is also fastened to a small bracket fastened to this same battery mounting.

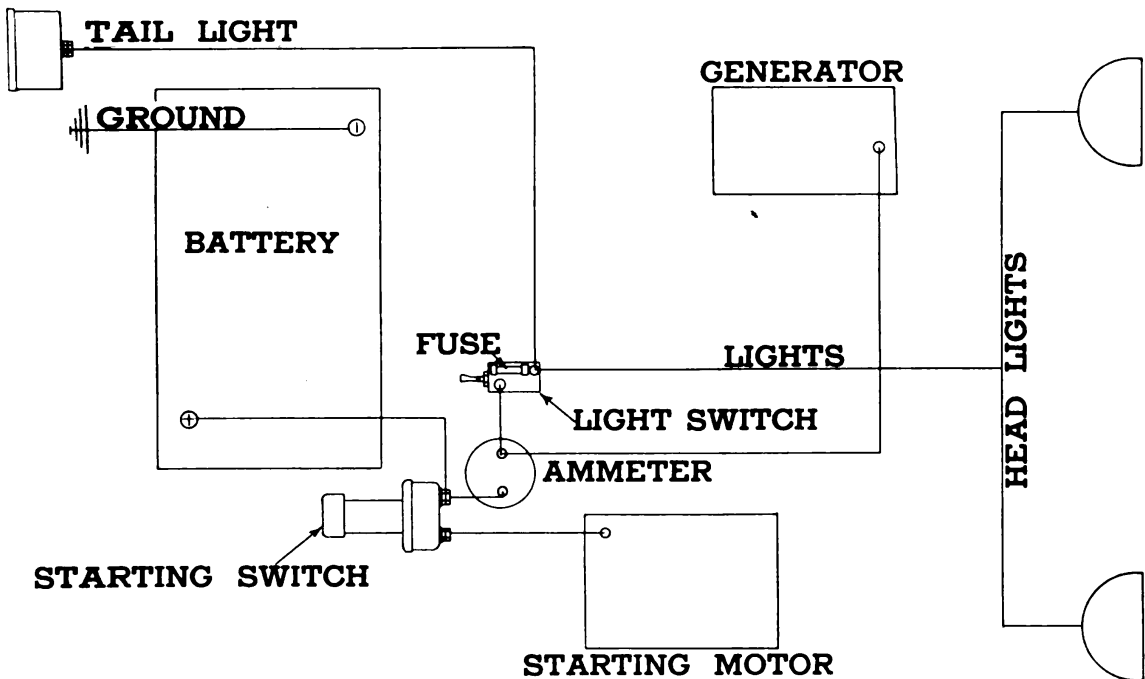


Fig. 45. Wiring Diagram

STARTING AND LIGHTING

Lubrication

The only parts of the lighting and starting system that need lubrication are the generator and starting motor. A few drops of oil should be put in the oilers weekly, or every 64 hours of operation. The oiler openings in the ends of both starter and generator are closed with small sheet metal covers, which should be swung to one side, after cleaning the surrounding surfaces to prevent dirt getting in the lubricant reservoirs. Two lubrication fittings are provided on the generator, and one on the starter. Do not over-oil the starter. Three to five drops of oil are sufficient.

Generator

The generator used on the Model "DI" Series Tractor is of the belt driven, adjustable third brush type, with charging rate controlled by a "two-rate" regulator. As adjusted at the factory the generator charges approximately 11 amperes when battery is only partly charged, but when the battery approaches full charge, the two-rate regulator automatically reduces the charging rate of approximately 3 amperes, which is sufficiently low to prevent over-charging.

Charging rate is adjusted by shifting the position of the "third" brush, which is reached by removing the cover band on the rear end of the generator; the movable third brush is on top, somewhat toward the engine. By moving the third brush in the same direction as the rotation of the generator armature, the charging rate is increased; by moving opposite to armature rotation, the rate is reduced. However, there should normally be no reason for shifting the position of the third brush.

Occasionally the generator belt may need tightening to take up any stretch that may develop. Loosen the cap screws holding the adjusting strap to the

generator and to the engine and also the two cap screws holding the generator to its mounting bracket. Swing the generator outward to take up the slack, and tighten the adjusting strap, and then the mounting bracket screws. When properly adjusted, the belt may be depressed approximately 1" with the thumb, midway between the two pulleys. A greater tension on the belt than described above will throw an unnecessarily heavy load on the fan and generator bearings.

Two Charge Regulator

The factory adjustment of the regulator is such that the rate of charge is cut down when the battery is between three-quarters charged and fully charged. The exact state of charge is affected by many factors, such as age and condition of battery, temperature, rate of charge, type of service, etc., so that no definite figures can be given as to specific gravity reading of the battery electrolyte when the charge rate is reduced. In addition, on charging the battery the electrolyte specific gravity lags behind the state of charge, due to the heavy electrolyte settling to the bottom of the battery cells. By automatically controlling the charge rate in accordance with battery requirements, gassing of the cells is markedly reduced, the battery should give longer service, run down batteries prevented, and less water is required to maintain the proper electrolyte level.

The field fuse is located in the base of the regulator. The fuse can be removed by taking off the screw cap which is to be found on the front side of the regulator. Lack of movement of the ammeter needle under all running conditions, particularly immediately after starting the engine, indicates that the fuse has been burned out and needs replacing. In normal service this seldom occurs, but if the engine is operated without a battery and without the generator being grounded, or the fuse removed, the voltage may increase to an excessive value and burn out the fuse.

IF THE ENGINE IS EVER OPERATED WITH THE BATTERY REMOVED, ALWAYS PROTECT THE GENERATOR BY REMOVAL OF THE FIELD FUSE.

In case the generator continues to charge on high rate with the battery gravity 1.280 to 1.300, and particularly if the battery is gassing, the regulator setting may be defective. Calibrations of the circuit breaker and regulator are necessarily within close limits and no attempt at adjustment should be made without accurate meters. If this unit is not functioning correctly, it should be referred to your Case Dealer or to an official Auto-Lite service station, where the necessary technical information and equipment are available to maintain these units according to factory specifications.

BATTERY CARE

The following instructions apply to the battery in your Model "DI" Series Tractor.

1. Add distilled water, or clean rain water, as needed; check at regular intervals.
2. Keep battery in a healthy state of charge as shown by hydrometer readings.
3. Make sure that battery is properly fastened down.
4. Keep battery clean and dry—do not overfill.

CAUTION: The battery is in a hard rubber container and has a metal frame which acts as a holddown. When working around the battery, remember that all its exposed metal parts are "alive" and that no metal tool or wire should be laid across the terminals as a spark or short-circuit will result.

Sparks and lighted matches or exposed flames should be avoided near the battery, the gasoline tank and the fuel line.

When necessary to tighten or loosen the clamped connections at the battery terminals, use a wrench of the proper size. Care must be taken that the wrench does not come in contact with any of the other metal parts of the battery or metal parts of the tractor. When replacing terminals, attach grounded terminal last.

The hard rubber container should be held snugly in place. Avoid pulling down so tightly on the holddowns that the container becomes distorted.

Adding Water

Distilled water or other suitable water (such as rain water stored in a non-metallic container and collected from clean non-metallic roofs) is used to replenish the liquid lost as vapor during normal operation. Check level each week by unscrewing vent plugs and looking into each cell. Water must be added before the level lowers to the top of the separators.

NOTE: When filling, do not touch the lead sealing washer; to do so would break the no-overfill seal. Fill cells with clean distilled water until water raises close to lead sealing washer.

Batteries furnished in the Model "DI" Series Tractors as original equipment have a special type of filler neck construction, the purpose being to prevent over-filling. Accordingly these batteries can be filled with distilled or rain water until the solution begins to rise in the filler neck; when the cap is screwed back into place, a metal washer is depressed in such a way that the vent is connected with an air space inside each cell. This action provides room in place while the battery is charging, to obtain proper venting action.

In freezing weather, the water should be added just before using the tractor in order to mix the water with the electrolyte by the charging current from the generator. If water is added and the battery is left standing in freezing temperatures, the water will freeze just the same as though it were outside the battery.

Never add acid, electrolyte or any special powders or solutions.

Hydrometer Readings

Each week a hydrometer reading should be taken of each cell. The full charge gravity is between 1.270 and 1.285 at 80°F. In service the gravity should be between 1.225 and the full charge gravity. With normal use the generator should maintain the gravity above 1.250.

To prevent too much charge, especially if unusually frequent additions of water are required (such as over $\frac{1}{4}$ pint per month for all 3 cells) the generator and the two charge regulator should be checked to insure that the regulator is cutting back to the low rate satisfactorily.

Cleaning

Each week wipe the battery with a cloth dampened with water. In case battery becomes moist on top electrolyte, (filling too full is frequently the cause of moisture on top of battery) dampen the cloth with ammonia or bicarbonate of soda solution (one pound of soda to a gallon of water). Then rinse with water, making sure vent plugs are tight in place. Examine vent plugs to make sure the gas escape holes are clear.

If any corrosion on the connections is experienced, scrape or brush it off; then wash with or immerse in a soda solution or ammonia to neutralize any electrolyte remaining on the metal. After rinsing in water and drying, apply a thin film of terminal grease or vaseline. This procedure will eliminate corrosion, provided the battery is kept clean on top.

Be sure that terminal connections are tight at all times.

Storing

When the tractor is not in active use for extended periods, such as during the winter season, the battery should be recharged periodically to maintain its state of charge.

All storage batteries tend to discharge slowly when left inactive. The period during which they may remain inactive depends on the temperature and, to some extent, on the humidity of the atmosphere. At relatively high temperatures the batteries will maintain their charge for a shorter period than they will at a lower temperature.

We recommend that batteries be recharged at intervals as follows to maintain the charge and prevent detrimental internal chemical action.

Temperature	Maximum Recharge Intervals
70°—90° F.	Every month
50°—70° F.	Every two months
30°—50° F.	Every three months

Upon re-installing in the tractor, be certain that the negative (-) terminal of the battery is connected to the ground cable.

When the charge and also the electrolyte level is maintained in the heavy duty storage batteries, they will remain in good condition for long periods.

Where the tractor is stored outdoors or where the temperature drops below freezing, precaution should be taken to avoid damage to the cells from freezing. A badly discharged battery freezes more quickly than one which is well charged. For instance, a battery with specific gravity of 1.175 will freeze at 4° F.

Magneto Timing Instructions

1. Remove all wires and Nos. 2, 3 and 4 spark plugs from head. The No. 1 plug should remain in place. No. 1 plug is in the front cylinder, just to the rear of the radiator.
2. Place gear shift lever in neutral position.
3. Remove front hand hole cover on magneto side of engine.
4. Remove inspection plug in clutch housing.
5. Turn engine with crank until piston comes up strongly against compression.
6. Now remove No. 1 spark plug.
7. Pull downward on brake hub until No. 1 crank is up. When No. 1 crank is at top dead center a mark (D) will be seen on flywheel through inspection hole in clutch housing.
8. Hold magneto in an upright position and hold spark plug wire leading from hole marked No. 1 on distributor about $\frac{1}{8}$ " from aluminum frame of the magneto shown in Fig. 46.

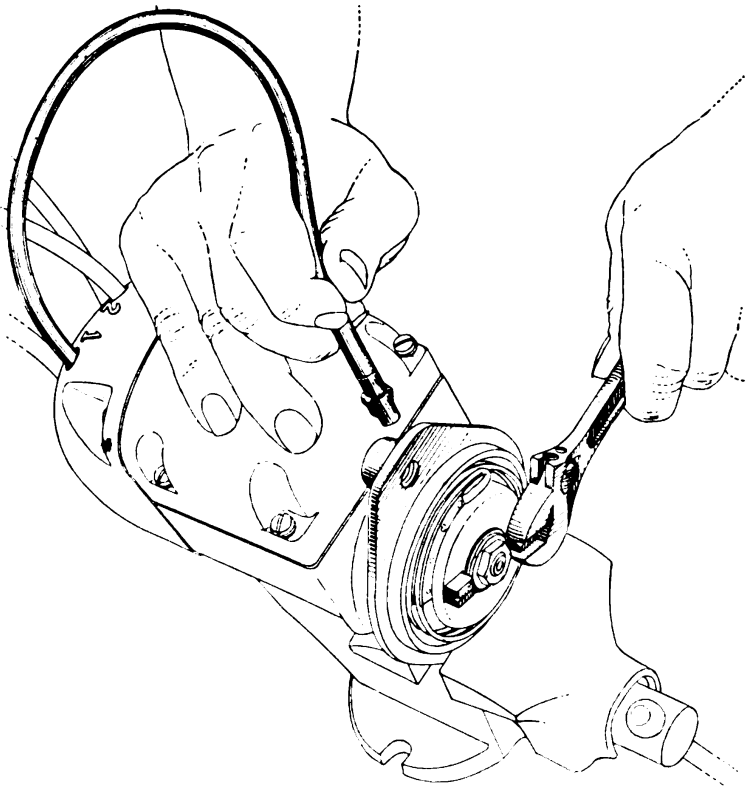


Fig. 46. Magneto Timing

9. Keep turning magneto with a wrench tripping the impulse shown in Fig. 46 until a spark jumps the gap between the wire and the frame. Be very careful to hold the wrench and magneto firmly so impulse will not move beyond the point where it trips and spark occurs, as it has a tendency to do this.
10. The driving lugs on impulse of magneto will be 30° beyond the horizontal center line of magneto and should match the magneto driving member on the governor shaft. Assemble magneto on tractor in this position.
11. Check to see that impulse trips freely so magneto will give a good starting spark. Should it bind from lack of end play, or other interferences, shim out by placing gaskets on flange of magneto until you are positive it is free.

Adjusting Breaker Points

In course of time, if the breaker points need adjusting, follow instructions in paragraphs 8 and 9, under Magneto Maintenance.

Lubrication of Magneto

The Case JMA Magneto used on this tractor is equipped with sealed ball bearings, as well as oilless bearings which require no lubrication except at time of general overhaul.

INSTRUCTIONS FOR SERVICING CASE JMA MAGNETO

NOTE: For Timing of Magneto, see Page 92.

When a Case Magneto returns from the field for service, it should be tested in the various following ways to determine what the trouble is before the magneto is torn down.

1. Place the Case Magneto, just returned from the field, on a bracket where it can be turned by hand. Put four spark plug wires from distributor on the magneto to four three-point spark gaps, set at $\frac{3}{8}$ " spark jump gap. Turn the magneto by hand in the same direction it would revolve on an engine to see if there is sufficient spark to jump the $\frac{3}{8}$ " gap at all four terminals; also to see if the impulse latches and trips freely like a new magneto, the FEEL of which a man should accustom himself to.

If the magneto is dead when it is being tripped by hand as in paragraph 1 then follow on. If it sparks O. K. refer to paragraph 14.

2. Remove distributor cap from magneto being careful not to pull distributor disc out of bearing thereby pulling gears out of mesh at the same time. The grounding spring fastened in the distributor block is assembled slightly back of distributor disc so when removing distributor cap it is necessary to turn it slightly clockwise to move grounding spring from in back of distributor disc.
3. See that the gears are meshed according to the marking on the teeth. (There is a red dot on the steel gear on rotor shaft, directly under one tooth which should mesh between two beveled teeth on distributor gear. On the distributor gear 'canvas base bakelite' there are two teeth beveled off. The bevel on the teeth should be on the side of the gear next to the red distributor disc as shown in Fig. 47. If it is on the side away from the red distributor disc, the gear is on the shaft wrong and should be turned over. Should the gear be on the shaft backwards, or the gears be missmeshed this would cause the T sector on distributor disc to be away from brushes in distributor cap when spark occurs. (This would cause magneto to become corroded and badly burn the distributor disc face.) If gears are meshed correctly, remove distributor disc.
4. If Magneto is corroded or rusty, this is caused by the spark jumping a gap in the magneto (which should not be). This could be caused from the following:

Spring on coil secondary lead too short or burned off and not making contact with brass insert in distributor cap. The distance from the edge of the top cover to the end of the spring should be $1\frac{3}{16}$ ".

Broken or stuck brushes in distributor cap.

Worn or broken spring on distributor disc.

Gears not properly meshed.

Distributor gear on the distributor shaft backwards. This should be with the bevel on the teeth next to the distributor disc.

5. After removing distributor disc, hold a screw driver (or any conductor) tight on the frame or bearing plate of magneto so that it passes about $\frac{1}{8}$ " from spring on secondary lead wire from coil. Run magneto at full speed and spark should jump from spring to grounded screw driver or conductor. If the magneto is dead refer to paragraph 9.
6. Should the spark be weak (only jumping $\frac{1}{16}$ " to $\frac{1}{8}$ ") recharge the magneto and test as before.

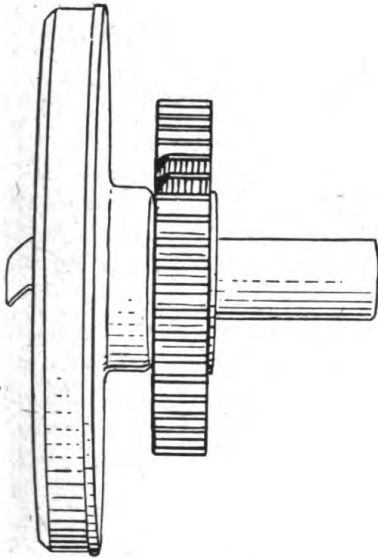


Fig. 47

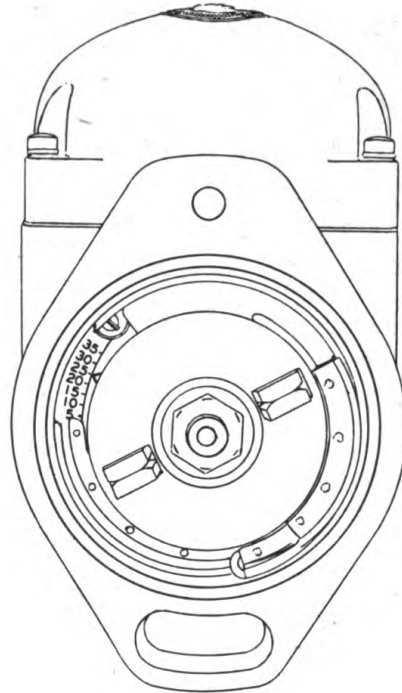


Fig. 48

7. Should the magneto spark be O. K. when testing as in paragraph 5, replace distributor disc with a new one; replace distributor block and check again as in paragraph 1.
8. Should the magneto still be dead, replace the distributor block with a new one and test again.
9. See if the breaker arm is free, and that the contact points are clean, and that the cam opens the breaker arm between .015" and .020", using your contact point opening gauge.
10. If the breaker arm is not free, remove breaker arm, clean fulcrum pin very thoroughly, also the bushing in the breaker arm and clean contact points. In cleaning the contact points, if they have a blue or black surface it will be necessary to remove this. This should be done with a whetstone and NOT A FILE, using a very fine stone and setting the points as nearly square on the stone as possible and rubbing it so that the point is made flat, being very careful to leave a very smooth surface on the point, which is essential. After stoning the points be sure they are clean and free of oil, washing with alcohol or some degreasing fluid.
11. If the magneto is still dead, run the magneto at the same speed it runs on an engine and see if there is any arcing at the contact points. In normal running there should be some tiny arcing between the contact points. If there is no arcing at the contact points, there is a ground in the primary circuit, or the condenser is shorted, which grounds it. Check this by removing the primary lead wire from the condenser leaving the primary wire fastened to the coil and breaker spring screw. If there is excessive arcing at the contact points, this indicates that the condenser was at fault which would also be indicated by excessive missing at the spark gaps, or perhaps the inability of the magneto to jump $\frac{3}{8}$ " gap; put in new condenser, and test again.

MAINTENANCE INSTRUCTIONS

12. Should the primary circuit (which follows the wire leading from the coil to the breaker arm and from the breaker arm through the contact points back to the bearing plate and through the grounding wire to the coil) be grounded or open-circuited before it gets to contact points it will be necessary to check to see if the insulation is broken on the lead wire or the wire is touching the bearing plate or condenser box.
13. If the magneto still is dead, remove the coil and replace with a new coil, and test again.
14. If a returned magneto sparks O. K. when turned by hand, then run the magneto at full speed to see if the spark cuts out at full speed. If the spark cuts out at full speed this indicates that the breaker arm is sluggish on the fulcrum pin, which must be free, and can be remedied by cleaning as in paragraph 10.
15. If the magneto is O.K. when tested as in paragraph 1, then run it at full speed and if spark is till O. K., it is then checked for timing on the synchroscope. The impulse should trip the number of degrees at which the arrow on stop pin plate indicates (this is located back of impulse as shown in Fig. 48.)
16. If the magneto still operates O. K., remove the distributor cap and see if there is any dirt or grease left between contact points which could have caused the magneto to fail. If points are dirty or discolored, clean as in paragraph 10. The contact points should have a frosted silver appearance on contact surface.
17. This impulse coupling timing should only be tested while the magneto is being turned by hand **VERY, VERY SLOWLY** on the synchroscope. In timing the magneto, should the cam become worn so that in order to properly time the magneto the contact points would open too far, then it is possible to reverse (or turn over) the cam which will create the same condition as a new cam; at this point the opening should be the right amount when the spark occurs at the right time. It is possible to adjust the timing of the spark by adjusting the contact points, as closing the gap tends to retard the spark, while opening the gap tends to advance the spark. This should take care of the necessary adjustment and still remain within the tolerance of opening.
18. If when checking in paragraph 1 the impulse coupling does not work according to these instructions, remove the impulse coupling from the magneto and see if there are any mechanical defects in the coupling. The impulse coupling hub should be free in the impulse shell, the spring holding it against the stop in the shell. The impulse pawls should be very free on the bosses on the impulse coupling hub, and the end of the pawls which strike the stop pin should not be worn or broken off at the corner which drags over the stop pin. Do not use any grease and only very rarely a very light oil on the bosses of the impulse where the pawls fulcrum.

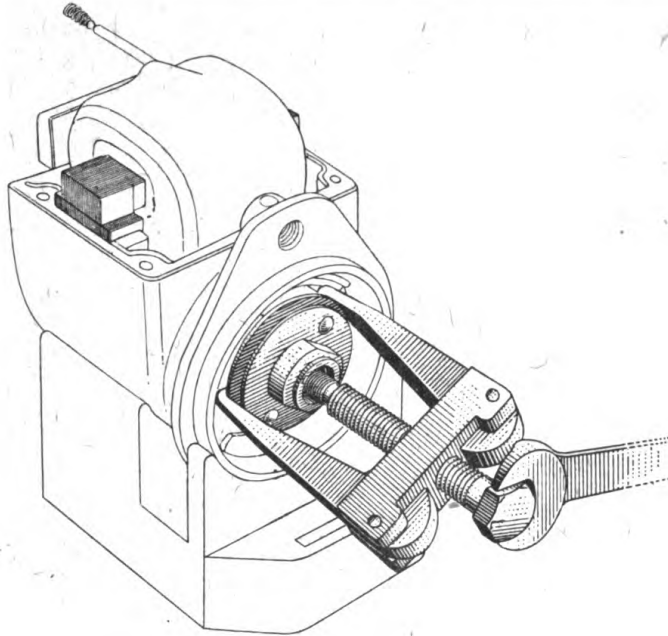


Fig. 49

HOW TO DISMANTLE CASE JMA MAGNETOS

In dismantling or assembling Magnetos use Tool No. 29, Fig. 57 to support frame which will hold it in position for most all operations.

19. Impulse Coupling

Remove the impulse coupling by unscrewing the nut, using wrench No. 28, and socket wrench similar to tool No. 26, in hole in Tool No. 29, and applying the impulse coupling puller No. 23, Fig. 57 to the coupling and the end of the shaft as shown in Fig. 49.

20. Distributor Cap

Remove two screws and two nuts and draw straight forward slowly turning slightly clockwise to keep from pulling out distributor disc.

21. Top Cover

Remove four screws and lift up.

22. Distributor Disc and Gear

Draw the distributor disc assembly forward out of the bearing.

23. Rotor Drive Gear

Remove snap ring and pull off steel gear by prying with two screw drivers.

24. Breaker Bar

Remove breaker spring screw and pull off breaker bar.

25. Bearing Plate

Remove four screws and take off bearing plate.

26. Rotor

Draw rotor out of frame, realizing that the moment you have done so you have weakened the magnet, and that it must be charged up again after inserting rotor into the frame.

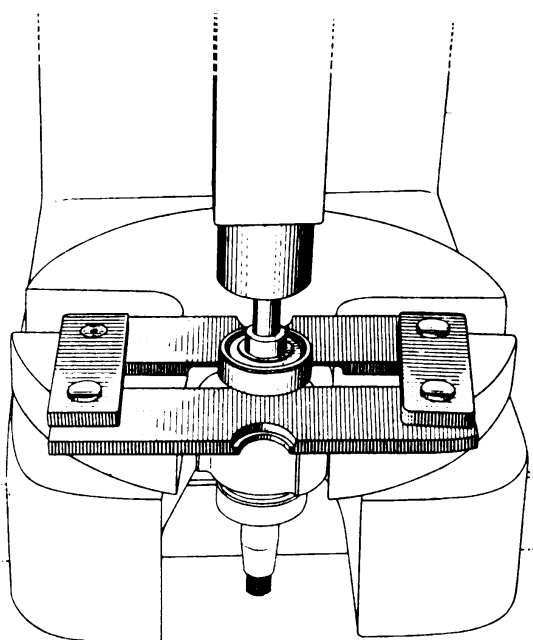


Fig. 50

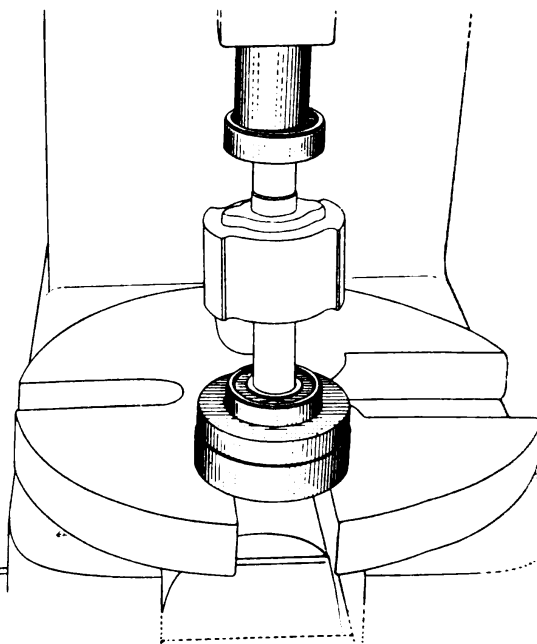


Fig. 51

27. **Bearings**

Turn bearing to see if there is any sluggishness. If so, bearings should be removed, using tool No. 4 and No. 20 as shown in Fig. 50 and replaced with new bearings using tool No. 24 and No. 25 as shown in Fig. 51.

28. **Condenser**

Remove nut and primary lead terminal and two screws.

29. **Stationary Contact Point and Support**

Remove two screws and clamp plate.

30. **Coil**

Remove coil from frame by using coil puller No. 14 as shown in Fig. 52.

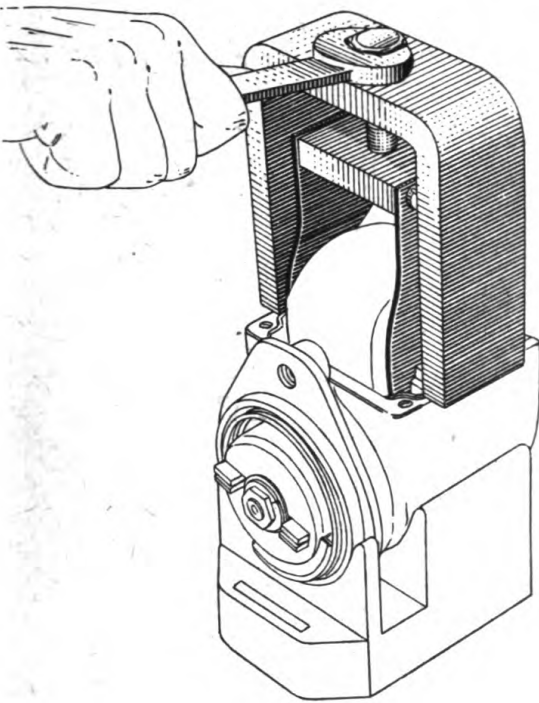


Fig. 52

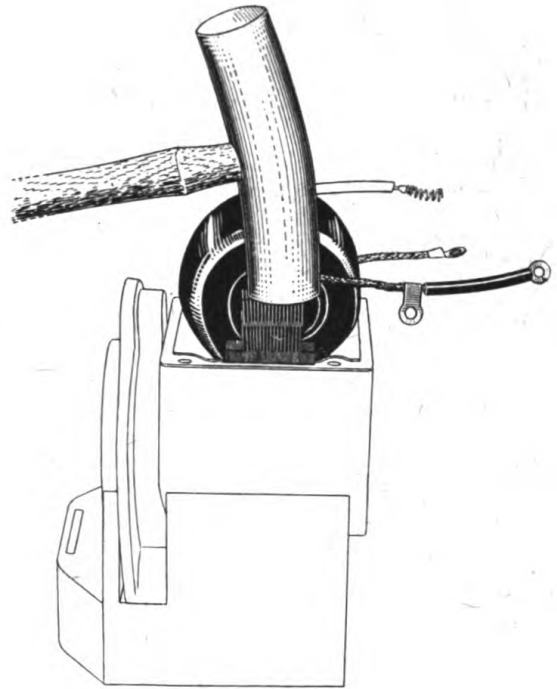


Fig. 53

HOW TO REASSEMBLE CASE JMA MAGNETOS

In dismantling or assembling Magneto use tool No. 29 to support frame which will hold it in position for most all operations.

31. Be sure all parts are exceptionally clean before assembly. Do not try to clean one part, then assemble it as there will be too much dirt getting into the magneto.
32. If necessary to replace coil, place coil in frame, as shown in Fig. 53 starting interlacing bridge with the pole pieces, then press to place using tools No. 29 and No. 19 as shown in Fig. 54.
33. Place condenser on frame. Be sure both screws are tight on lock washers.
34. Insert rotor in frame, making sure frame is clean and rotor is clean. Press rotor in with hand; bearings should not be tight.
35. Assemble bearing plate in place making sure grounding wire is fastened under upper right hand screw and the breaker bar spring support is assembled on the bearing plate.
36. Assemble stationary contact point with two screws and locking plate.
37. Assemble breaker bar in place. It should require 11 to 15 oz. on rubbing block to open contact points.
38. Assemble cam on shaft.
39. Assemble two spacing washers between cam and gear.
40. Assemble gear on shaft and place snap ring on shaft.
41. Be sure top cover gasket is not broken and primary wire lock nut and lock washer is tight on condenser terminal. Then assemble top cover.

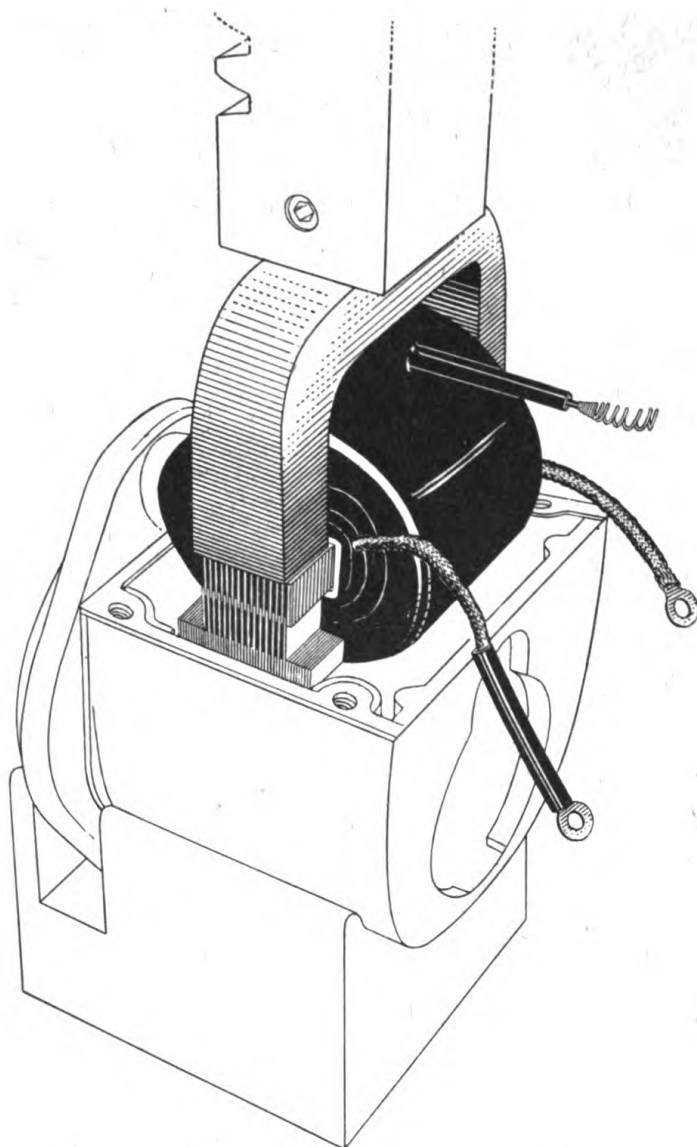


Fig. 54

42. When charging the magnet through the frame, place the frame between the blocks on the ends of the charging coil poles with the keyway on the driving shaft horizontal and remembering that the keyway is on the North Pole side of magnet.
43. Place impulse stop pin plate in frame, placing arrow to number which will give desired impulse lag angle as shown in Fig. 48. Then screw down tight.
44. In assembling impulse coupling be sure hub is free in the shell. Try this before assembling spring. In assembling the spring, hook coil on end of spring over the support which holds it by placing the spring in groove and twisting down as shown in Fig. 55. This locks the spring so it cannot come off support.
45. Place woodruff key in rotor shaft and assemble impulse coupling on shaft being very careful not to push key out of keyway in shaft. This key can be seen in the keyway after impulse coupling is in place before nut is replaced.

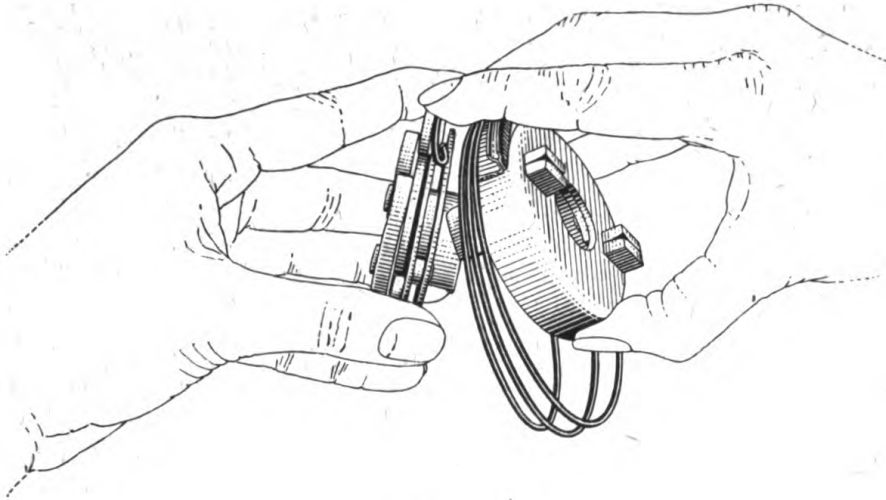


Fig. 55

46. Assemble nut tightly on shaft with spacer, lockwasher and nut. Be sure to get key on spacer in keyway in impulse hub.
47. Test Magneto on synchroscope for proper timing. Check position where impulse trips by turning magneto very slowly by hand, as there is always a lag in the time between where the impulse trips and the time where the spark occurs, when magneto is in motion.
48. When the magneto is timed correctly there should be .015" to .020" between contact points when the rubbing block is on the high point of the cam.
49. Be sure face of distributor disc is smooth where brushes rub.
50. Place distributor gear assembly in frame being careful to match gear teeth as marked. Tooth over red dot on steel gear is to be placed between two beveled teeth on fabric gear which are also painted red on the bevels. Bevels should be on side of gear next to distributor disc as shown in Fig. 47. Check again to see teeth are properly matched.

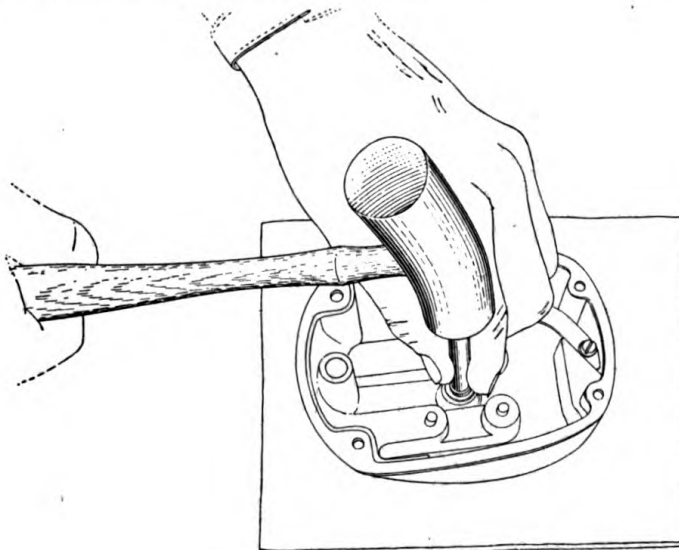


Fig. 56

51. Be sure distributor cap gasket is not broken, brushes are free, and center brush is not worn down below brass retainer. If center brush needs replacing, remove old brush and reassemble new brush using tool No. 27 as shown in Fig. 56.
52. After assembling distributor disc and distributor block, check to see if magneto is O. K. and that grounding terminal grounds magneto.
53. If the magneto does not ground out, when you press the outside grounding spring to the screw, remove distributor cap and bend inside grounding spring so that it will touch breaker spring screw when cap is replaced.

MAGNETO SERVICE EQUIPMENT

The equipment required to service Case JMA Magnetos consists of—

- Charging Coil — Purchased from Indiana Steel Products Co., Valparaiso, Ind.
or similar unit
- Synchroscope — Purchased from H. G. Makelim — 1583 Howard St.,
San Francisco, Calif. or similar unit
- Coil Tester — Purchased from Eisemann Magneto Co., Brooklyn, N. Y.
or similar unit
- No. 3 Famco Arbor Press — Purchased from C. W. Leinen Mfg. Co.,
Racine, Wisconsin or similar unit

The following tools shown on page 103 Fig. 57, may be purchased from J. I. Case Co., Magneto Division; Rockford, Illinois or from any of their authorized Magneto Distributors.

1. Can of VH Talc
4. Gear and Ball bearing puller
5. Can of soldering paste
7. Contact point and spark plug gap gauges
8. Small screw driver
11. Composition mallet
13. Electric soldering iron
14. Coil puller
17. Large screw driver
19. Yoke for driving coil on pole pieces
20. Gear and ball bearing puller
23. Impulse coupling puller
24. Tool for assembling ball bearings on shaft
25. Tool for assembling ball bearings on shaft
26. Socket wrench for impulse coupling nut
27. Driving tool for center brush
28. Impulse lug wrench
29. Magneto frame supporting stand

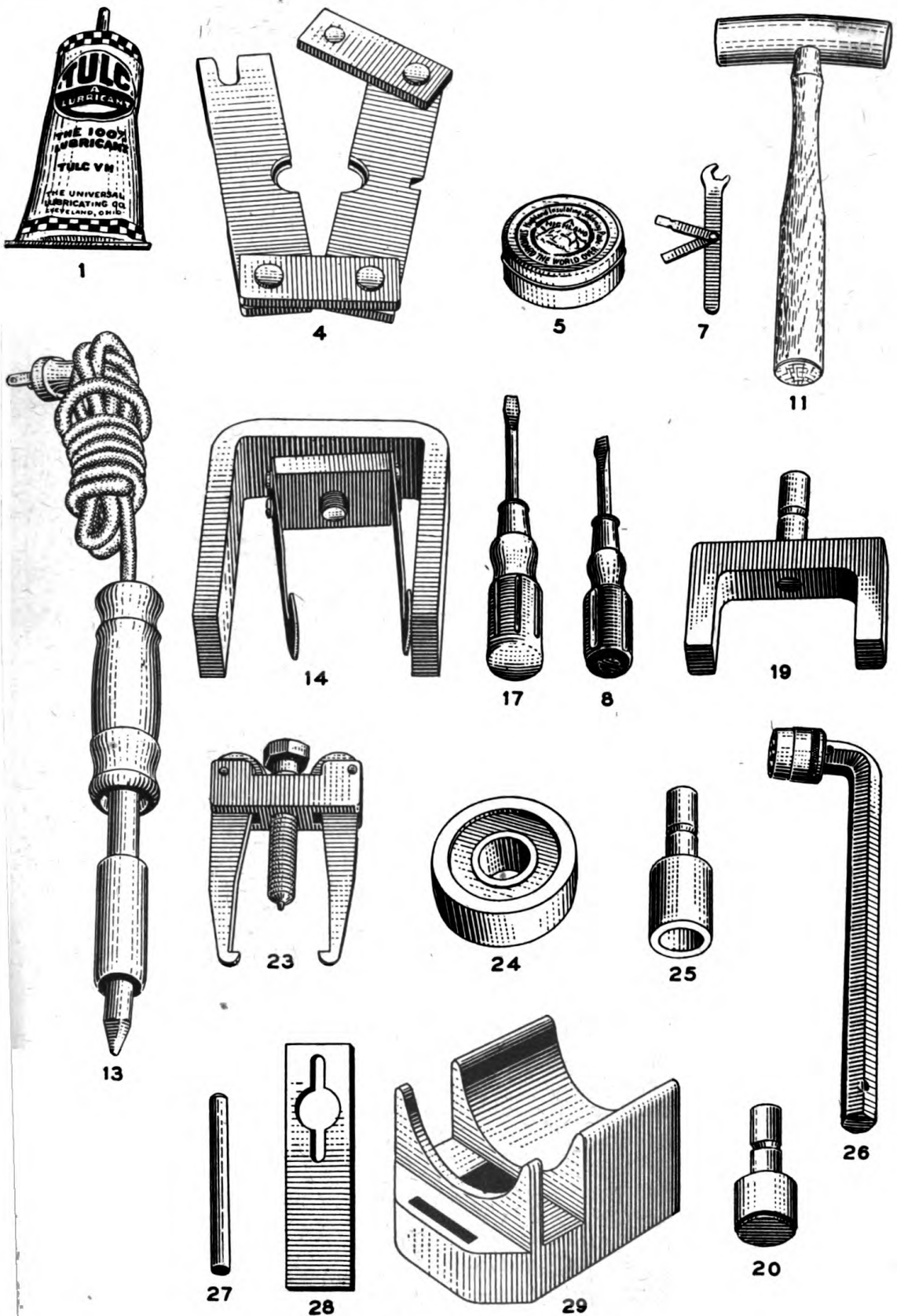


Fig. 57. Magneto Service Tools

MAINTENANCE INSTRUCTIONS

No. on Cut	Part No.	Description of Parts Shown on Page 105, Fig. 58
1—	952-A	Bearing Pulling Attachment
2—	924	Threaded Adapters $\frac{3}{4}$ " NF (per pair)
3—	924	Threaded Adapters $\frac{3}{4}$ " NF (per pair)
4—	938	Push-Puller with No. 930-D $9\frac{1}{2}$ " Legs
5—	630-3	Step Plate $1" \times 1\frac{1}{4}"$
6—	630-8	Step Plate $1\frac{5}{8}" \times 2"$
7—	1003	Grip-o-matic Puller with short jaws, 15 ton Capacity
8—	936	Threaded Adaptor $1\frac{1}{8}"$ NF
9—	C-650	Governor Gear Pulling Plate
10—	C-648-A	Extra Pin for C-648
11—	943	Extra Pin for C-648
11—	943	Bearing Cup Pulling Attachment
12—	952-B	Forcing Bolts for No. 952 Attachment (per pair)
13—	C-648	Special Adaptor $1"$ Female
14—	1002	Grip-o-matic Puller with short jaws, 9 ton Capacity
15—	938-J	Swivel Sleeve Pulling Attachment
16—	930-E	Push-Puller Legs $4\frac{1}{2}"$ long
17—	C-649	First Reduction Shaft Bearing Puller
18—	930-B	Push-Puller Legs $16\frac{1}{2}"$ long
19—	970-5	Sleeve Pulling Adaptor Plate $3\frac{1}{2}"$
20—	970-8	Sleeve Pulling Adaptor Plate $3\frac{7}{8}"$
21—	970-14	Sleeve Pulling Adaptor Plate $4\frac{5}{8}"$
22—	CA	Display Board (only) $3' \times 4'$
23—	930-A	Adaptor $1"$ Female x $\frac{5}{8}"$ Male (not shown)

NOTE: The Case Company does not stock these tools, they should be purchased from the Owatonna Tool Co., Owatonna, Minn.

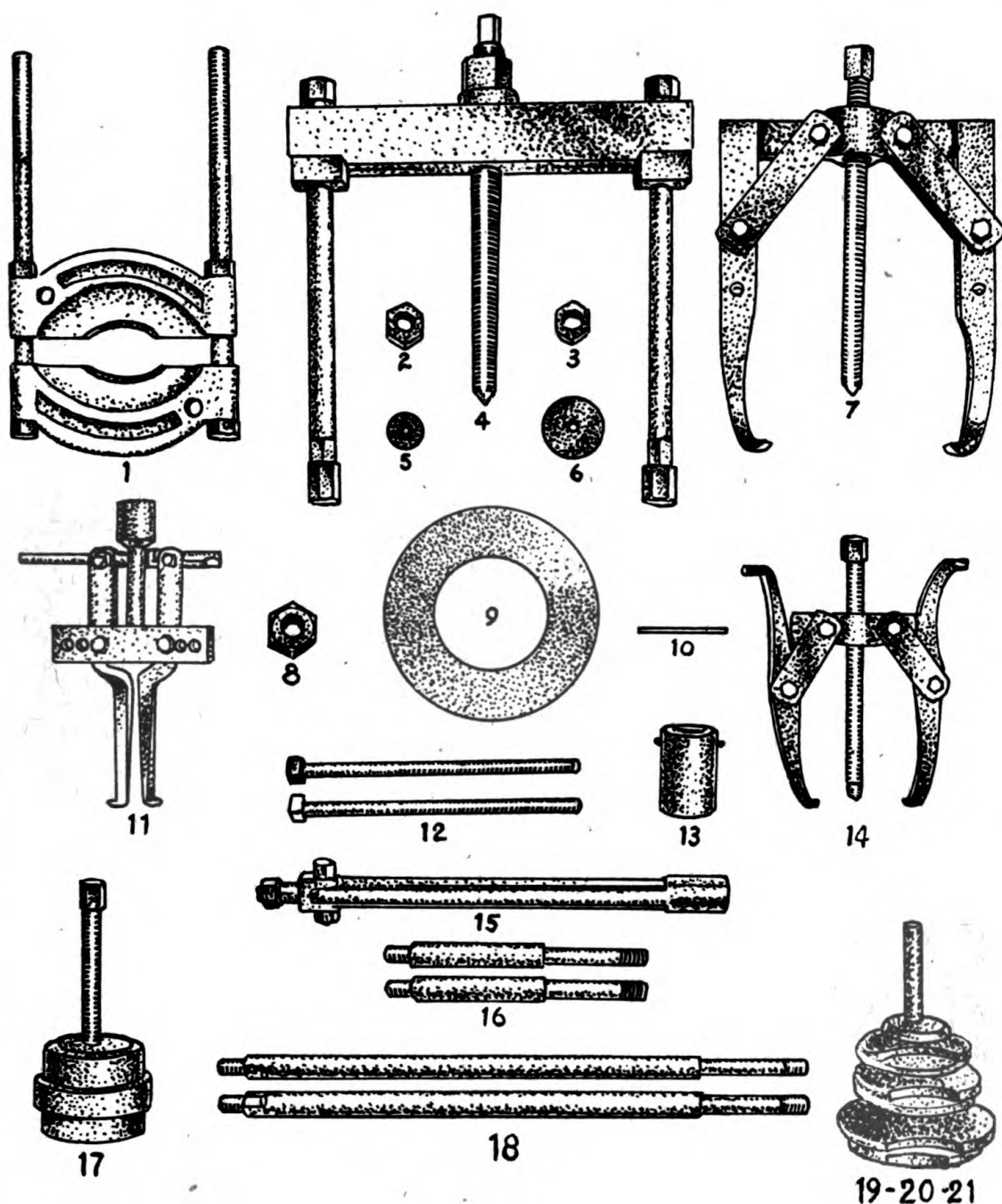


Fig. 58. Tool Set

STORING THE TRACTOR

Refer to tentative technical manual **TM 5-9715 Preparation of Corps of Engineers Equipment for Storage**, issued by the **Engineer Field Maintenance Office**, P. O. Box 1679, Columbus, Ohio.

EXPORT SHIPMENT

Refer to **TB5-3000-1 Preparation of Tractor, Wheeled, Rubber-Tired, Gasoline, 30 DBHP, Rigid, Case, Model "DI"**, for export issued by the **Engineer Field Maintenance Office** P. O. Box 1679, Columbus, Ohio.

MEMORANDUM

Memorandum
Page 107

MEMORANDUM

This image shows a single page of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There is no handwriting or other markings on the paper.

ALPHABETICAL INDEX TO PARTS LIST

WARNING

SPARE PARTS can be supplied promptly and accurately only if positively identified by correct part number and correct part name.

FURNISH THIS INFORMATION ON ALL REQUISITIONS. WITHOUT FAIL, on all requisitions, give name of machine, name of manufacturer, model or size, manufacturer's serial number of each machine and subassemblies attached to machine, and components and accessories for which spare parts are required. List spare parts for only one make or kind of machine on each requisition.

Requisitions must be double spaced to provide room for office notations when necessary.

ALPHABETICAL INDEX

	Illustrations Page	Description Page
Air cleaner.	10	
Air cleaner assembly	11	
Brake, hand.	42	
Brake, hand, assembly.	43	
Brake, rear wheel.	62-63	
Brake, rear wheel, assembly.	64	
Cam shaft.	8	
Carburetor parts	13	94
Clutch	32	
Clutch assembly.	35	
Clutch shaft	34	
Clutch throwout parts.	33	
Connecting rod	7	
Crank shaft.	7	
Cylinder barrel.	7	
Cylinder block	6	
Cylinder head.	6	
Differential	44	
Differential assembly.	45	
Draw bar	55	
Electric lighting and starting parts	26	
Engine assembly.	9	
Fan and water pump	20	
Fan and water pump assembly.	21	
Fire extinguisher.	67	
First reduction shaft.	38	
First reduction shaft assembly	39	
Front axle	56	
Front wheel and axle assembly.	58	
Front wheel and spindle.	57	
Fuel strainer.	25	95
Fuel tank.	25	
Gear shift parts	46	
Generator parts.	28	96
Governor	14	
Governor assembly.	15	
Grease gun	68	99
Head lamp parts.	27	99
Hood, engine	22	
Hour meter	66	

A Careful Operator

**IS THE BEST INSURANCE
AGAINST AN ACCIDENT**

—National Safety Council.

ALPHABETICAL INDEX

(Continued)

	Illustrations Page	Description Page
Instrument panel	52	
Magneto parts	30	93
Manifold	10	
Manifold, carburetor, and air cleaner assembly . . .	11	
Muffler	12	
Numerical Index		70-107
Oil filter attachment	18	
Oil filter parts	19	95
Oil pan	6	
Oil pump	16	
Pistons	7	
Platform, tool box, and throttle control	54	
Power take off	48	
Power take off assembly	49	
Push rods	8	
Radiator and hood	22	
Radiator bracket	24	
Rear axle	60	
Rear axle assembly	61	
Rear wheel	60	
Seat	53	
Shifter shaft assembly	47	
Shutter and screen for radiator	23	
Sliding gear shaft	40	
Sliding gear shaft assembly	41	
Starting crank	24	
Starting motor parts	29	98
Steering gear	50	
Steering gear assembly	51	
Tail lamp parts	27	99
Throttle control	54	
Tire pump	65	
Tools	69	
Transmission case	37	
Valves	8	
Water pump and fan	20	
Wheel, front	57	
Wheel, rear	60	

PREPARATION OF REQUISITIONS

A sample requisition in the correct form for submission by the Engineer Property Officer is shown on the opposite page.

THIS SHALL BE FOLLOWED IN MAKING OUT REQUISITIONS

In order to eliminate duplication of work, Property Officers may authorize organizations to prepare requisitions in final form, leaving requisition number space blank for completion by Property Officer.

THE FOLLOWING RULES WILL BE OBSERVED CAREFULLY IN PREPARING REQUISITIONS FOR SPARE PARTS:

- a. Prepare a separate requisition for each different machine.
- b. Type "SPARE PARTS" in upper right hand corner of requisition form.
- c. State PERIOD designation by use of one of the following terms:
 - (1) "INITIAL"—first requisition of authorized allowances.
 - (2) "REPLENISHMENT"—subsequent requisitions to maintain authorized allowances.
 - (3) "SPECIAL"—requisitions for necessary repairs not covered by allowances.
- d. Give complete shipping instructions.
- e. State proper nomenclature of machine, and make, model, serial number and registration number.
- f. State basis of authority, and date delivery is required, immediately below description of machine.
- g. Group parts required under group headings as shown in manufacturer's parts catalogs.
- h. State manufacturers' parts numbers and nomenclature descriptions accurately and completely. Do not use abbreviations.
- i. Double space between items.
- j. Emergency requisitions sent by telephone, telegraph, or radio must always be confirmed immediately with requisition marked: "Confirming (state identifying data)."
- k. Nonexpendable items must be accounted for.

PREPARATION OF REQUISITIONS

Sample Copy for Use in the Preparation of Requisitions

Revisions in QMC Form 400 for requisitioning spare parts are confined to new column headings. Until new forms are available all organizations will use the present form and type or write in corrections indicated.

Under revised heading "Nomenclature and Unit" list the article and the unit (ea for each; lb for pound; etc.). Under heading "Maximum or Authorized Level" list the authorized organizational allowances or depot stock levels given in ENG 7 and ENG 8 of the ASF Engineer Supply Catalog (superseding Part III, Corps of Engineers Supply Catalog). The total number on hand for each item is listed under "On Hand". In column headed "Due In" enter the total quantity previously requisitioned but not delivered. Column headed

"Required" is to be changed to read "Quantity Desired." In "Remarks" column enter additional information. For "Initial" and "Replenishment" requisitions, the sum of "Quantity Desired", "Due In", and "On Hand" should equal "Maximum or Authorized Level".

On this page is shown a sample requisition on QMC Form No. 400 which conforms to the latest revisions. The marginal notes give instructions for preparing a requisition for spare parts for Engineer equipment. Additional information on this subject is contained in Section ENG 1-2 of the ASF Engineer Supply Catalog (superseding Section AA-1 of Part III Engineer Supply Catalog), available on requisition from Engineer Field Maintenance Office, P. O. Box 1679, Columbus, Ohio.

State PERIOD designation by use of one of the following terms:

- (1) "INITIAL"—first requisition of authorized allowances.
- (2) "REPLENISHMENT"—subsequent requisitions to maintain authorized allowances.
- (3) "SPECIAL"—requisitions for necessary repairs not covered by allowances.

Type "SPARE PARTS" in upper right hand corner of requisition.

Give complete shipping instructions. Special instructions for packing, marking, routing, etc., should be given at the end of requisition.

State proper nomenclature of machine, also make, model, machine serial number and U. S. A. registration number.

Prepare a separate requisition for each different machine.

State basis or authority and date delivery is required, immediately below description of machine.

Double space between items.

Group parts required under group headings as shown in manufacturers' parts catalogs (Technical Manuals).

State stock numbers, manufacturers' parts numbers and nomenclature accurately and completely. Do not use abbreviations.

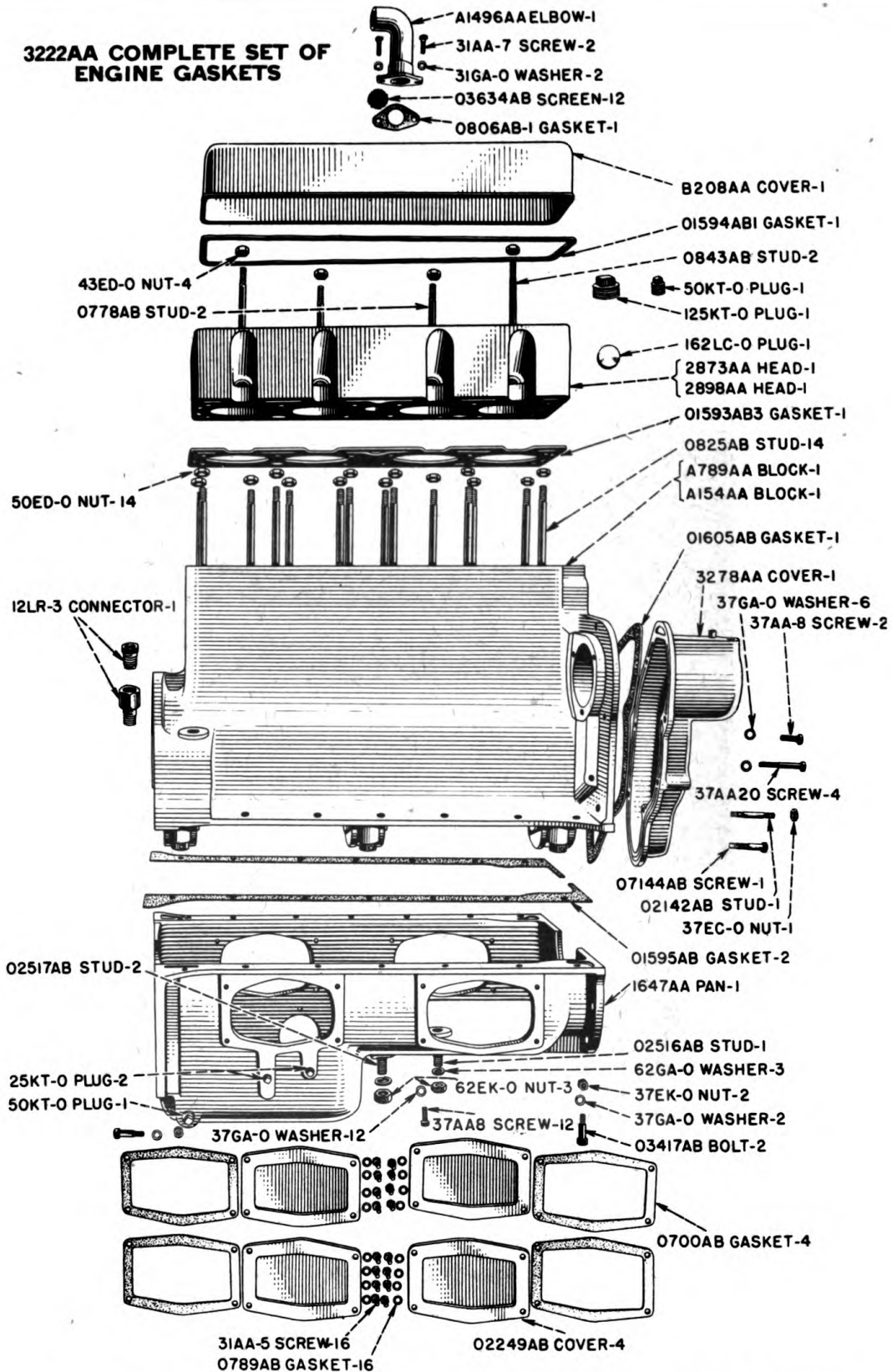
WAR DEPARTMENT Q. M. C. Form No. 400 (Revised 15 Aug. 1943)							
REQUISITION							
To: <u>Engineer Field Maintenance Office</u> P. O. Box 1679, Columbus, Ohio.				No. of Sheets <u>1</u>		Sheet No. <u>1</u>	
Requisition No. <u>E-531-3-44</u>				Date <u>6 October 1943</u>		Period <u>Special</u>	
SHIP TO <u>Engineer Property Officer, Pine Camp, New York.</u>							
MARKED FOR: <u>Supply Officer, 147th Engineer Regiment, Pine Camp, New York.</u>							
Requisitioned By (show Signature, Rank, Organization, Destination. If different from "SHIP TO" include address):				Approved For The Commanding Officer:			
<u>Robert E. Roe</u> Robert E. Roe. Major C. E. Engineer Property Officer				<u>John D. Doe</u> John D. Doe. Colonel. C. E. Executive Officer			
QFC. NO.	NOMENCLATURE AND UNIT	AUTH. OR MAX. LEVEL	ON HAND	DUE IN	REQUIRED	APPROVED	
PARTS FOR <u>TRACTOR, GASOLINE, CASE MODEL D.I.</u> <u>SERIAL NO. 4710480 USA, REG. NO. B10577</u>							
<u>Basis: Repair of Disabled Equipment</u>							
<u>Delivery is requested by February 18, 1943.</u>							
<u>CASE ENGINE GROUP</u>							
<u>CYLINDER HEAD, CYLINDER BLOCK AND OIL PAN PARTS</u>							
2873AA	CYLINDER HEAD WITH VALVE GUIDES ea.	--	0	0	1		
01593AB3	GASKET FOR CYLINDER HEAD ea.	--	0	0	1		
01594AB1	GASKET FOR CYLINDER HEAD COVER ea.	--	0	0	1		
<u>VALVES PUSH ROD AND CAMSHAFT PARTS.</u>							
07583AB	EXHAUST AND INLET VALVES ea.	--	0	0	8		
<u>TRANSMISSION GROUP</u>							
01405AB	GASKET FOR TRANS. HAND-HOLE COVER ea.	--	0	0	2		
<u>REAR AXLE GROUP</u>							
04630AB	REAR AXLE SHAFT ea.	--	0	0	1		

*Nonexpendable items such as tools must be accounted for, when requisitioned, by a statement that they have been placed on REPORT OF SURVEY or STATEMENT OF CHARGES.

Emergency requisitions sent by telephone, telegraph or radio must always be confirmed immediately with requisition marked: "Confirming (state identifying data)."

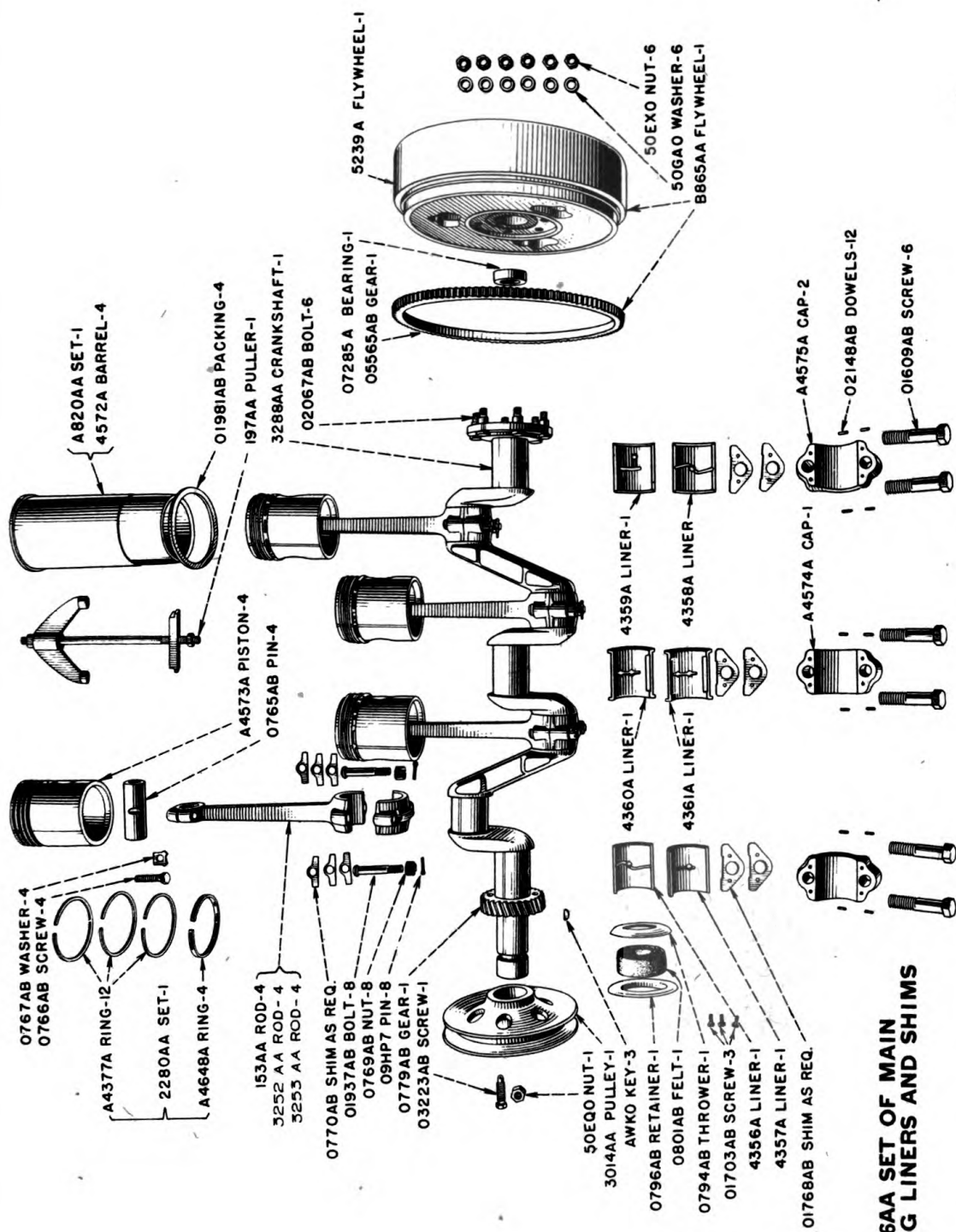
CYLINDER HEAD, CYLINDER BLOCK, AND OIL PAN PARTS

3222AA COMPLETE SET OF ENGINE GASKETS



Unnumbered parts in illustrations are the same as corresponding parts shown with numbers.

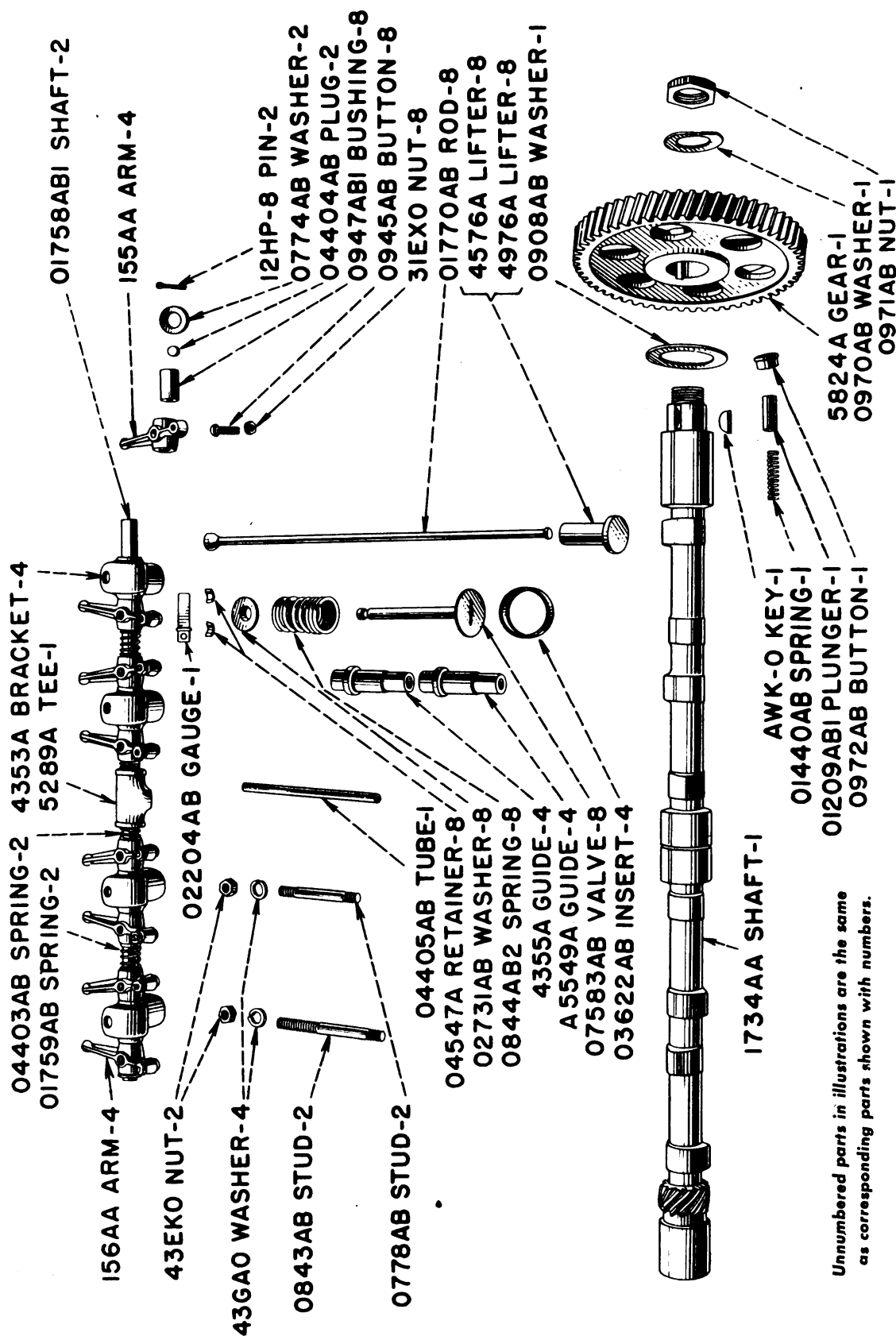
PISTONS, CONNECTING RODS AND CRANKSHAFT



3206AA SET OF MAIN BEARING LINERS AND SHIMS

Unnumbered parts in illustrations are the same as corresponding parts shown with numbers.

VALVES, PUSH RODS AND CAMSHAFT



Unnumbered parts in illustrations are the same as corresponding parts shown with numbers.

B208AA
 0945AB
 0843AB
 0806AB
 03634AB
 A1496AA
 0825AB
 0891AB

GASKET
 SCREEN
 STUD
 GASKET

5360A
 0886AB
 4975A
 01593AB3
 A4377A
 A4648A
 0765AB
 0767AB
 0766AB
 A4573A
 0889AB
 4572A
 01981AB
 04990AB
 3/8x1/8 FITTING
 A789AA
 01768AB
 01595AB
 A4575A
 A4574A
 01609AB
 0700AB
 02249AB

FERRULE
 LIP WASHER
 GASKET
 SHIMS
 GASKET
 FRONT REAR
 CENTER
 GASKET
 GASKET
 REINFORCEMENT
 SCREW

02846AB
 01189AB
 93AA
 04407AB

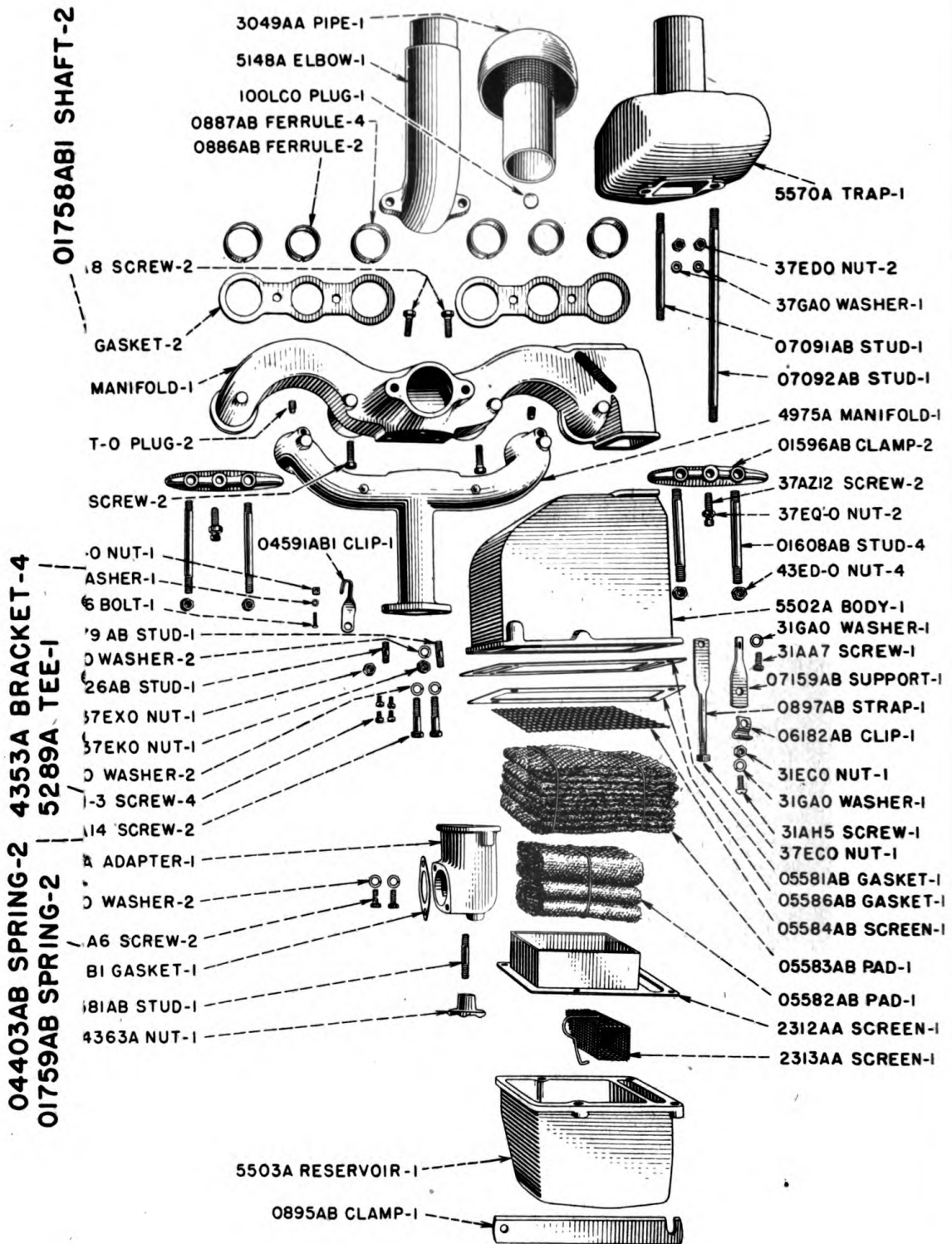
EXHAUST
 SPRING
 EXHAUST

SNAP RING
 BUSHING
 LIP WASHER
 KEY
 SHAFT

SNAP RING
 SPRING
 GASKET
 FAN BELT
 LOCK WASHER
 SPRING

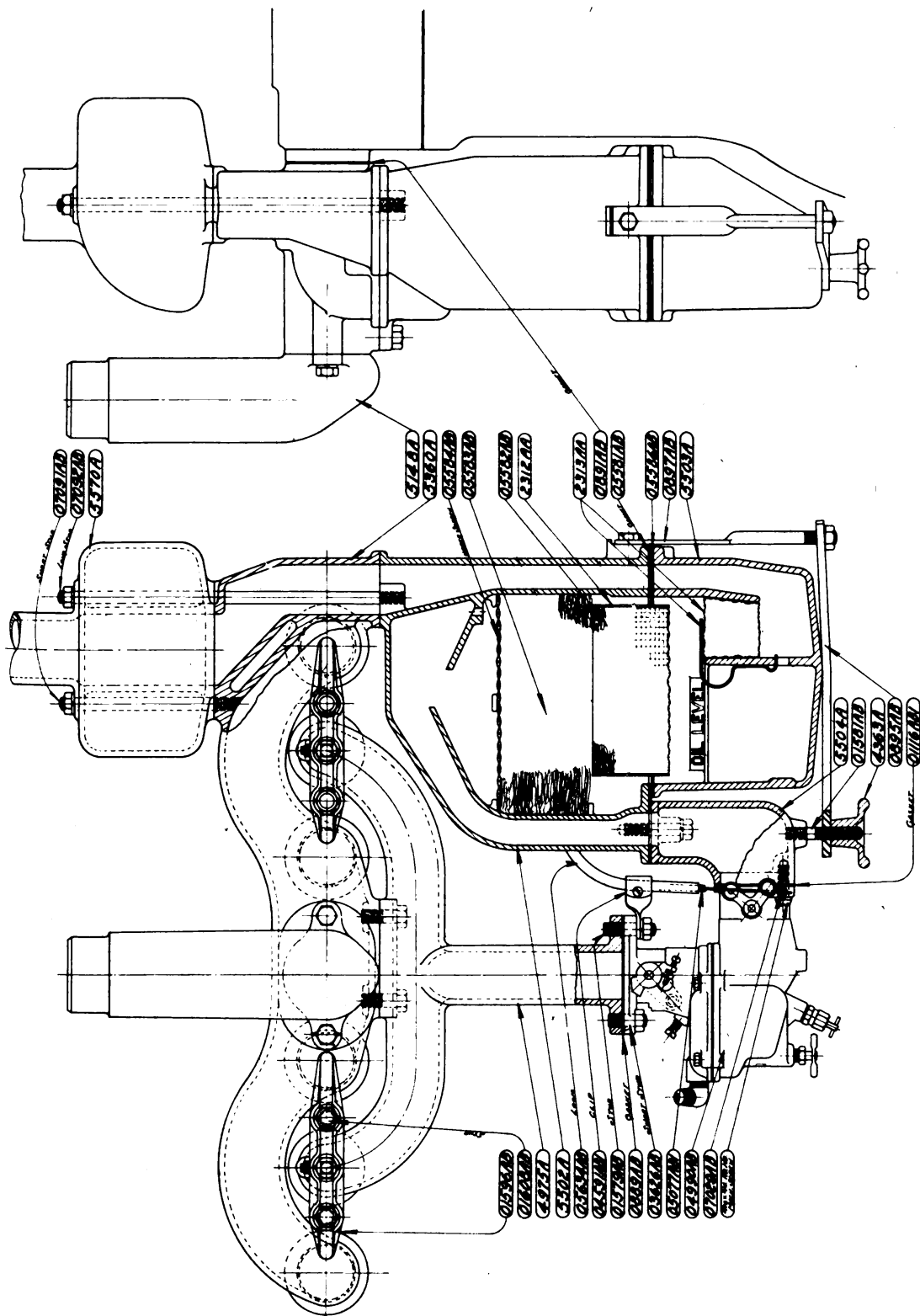
GASKET

MANIFOLD AND AIR CLEANER

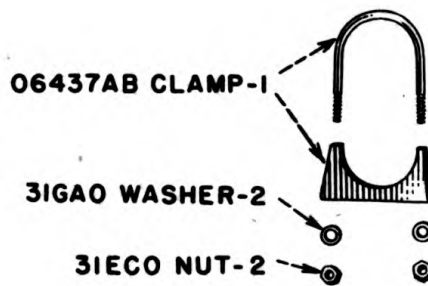
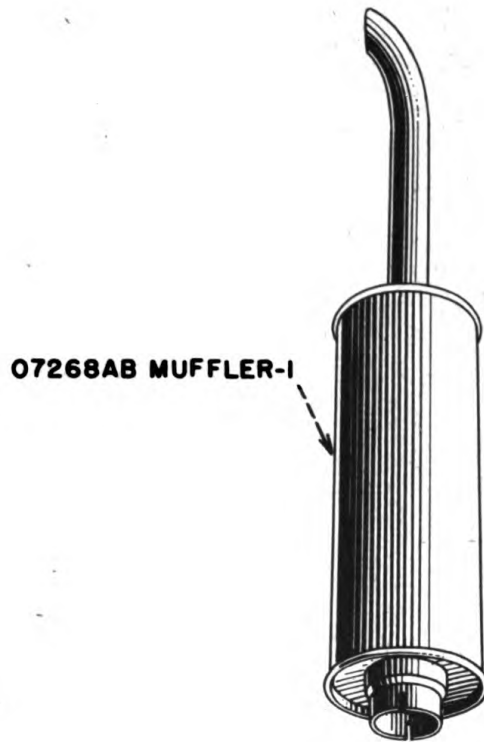


Unnumbered parts in illustrations are the same as corresponding parts shown with numbers.

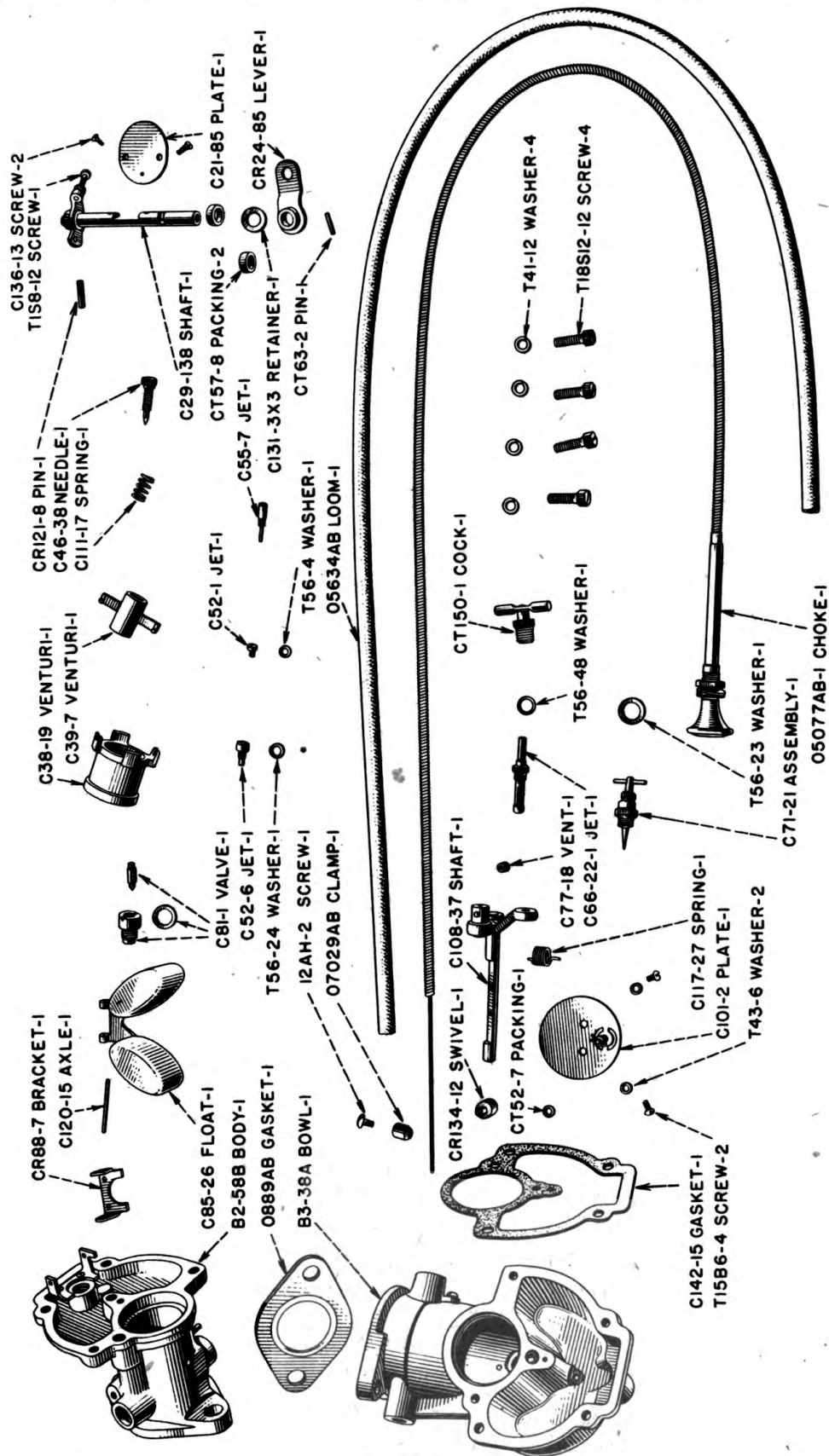
AIR CLEANER ASSEMBLY



MUFFLER

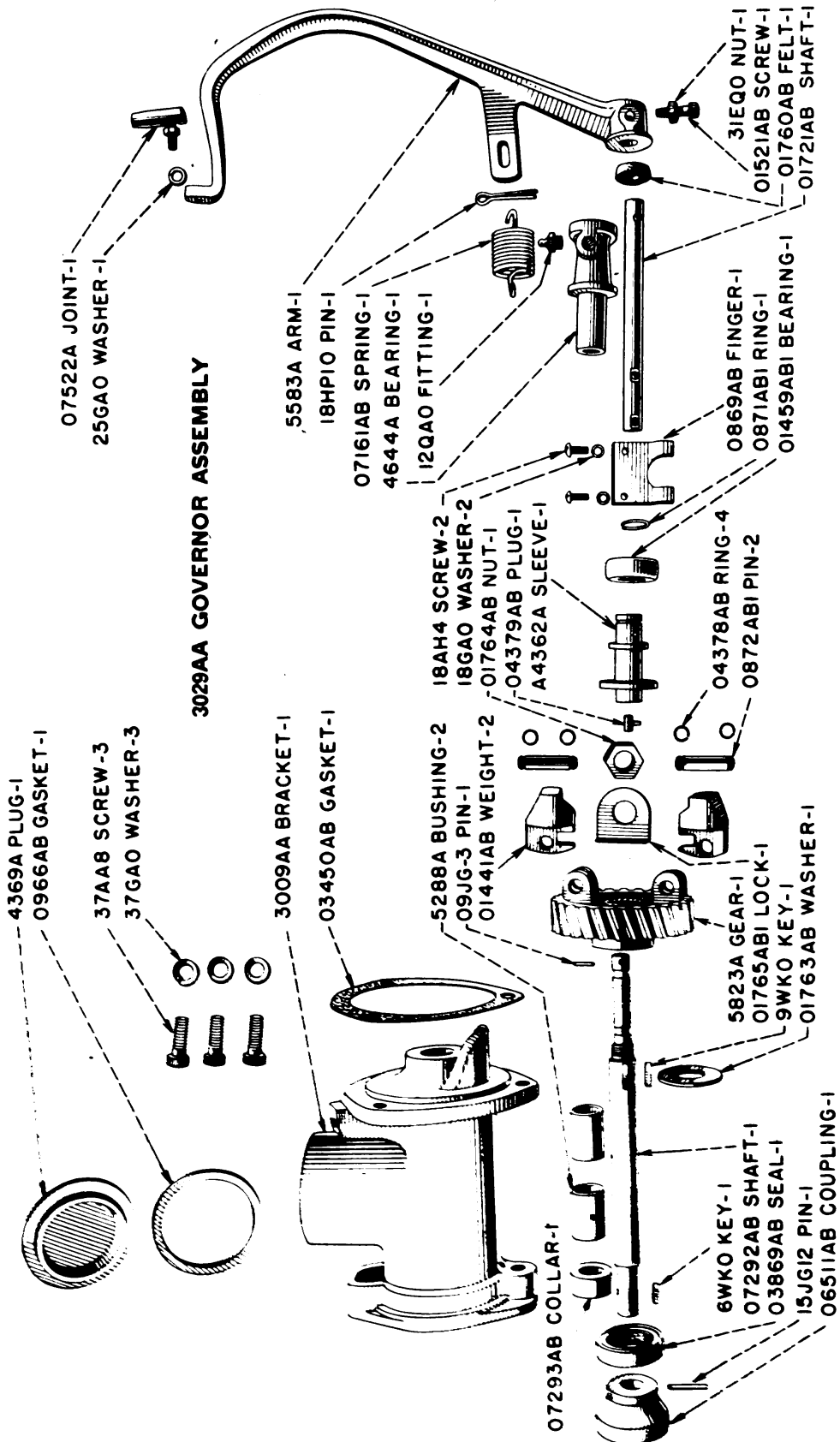


CARBURETOR PARTS



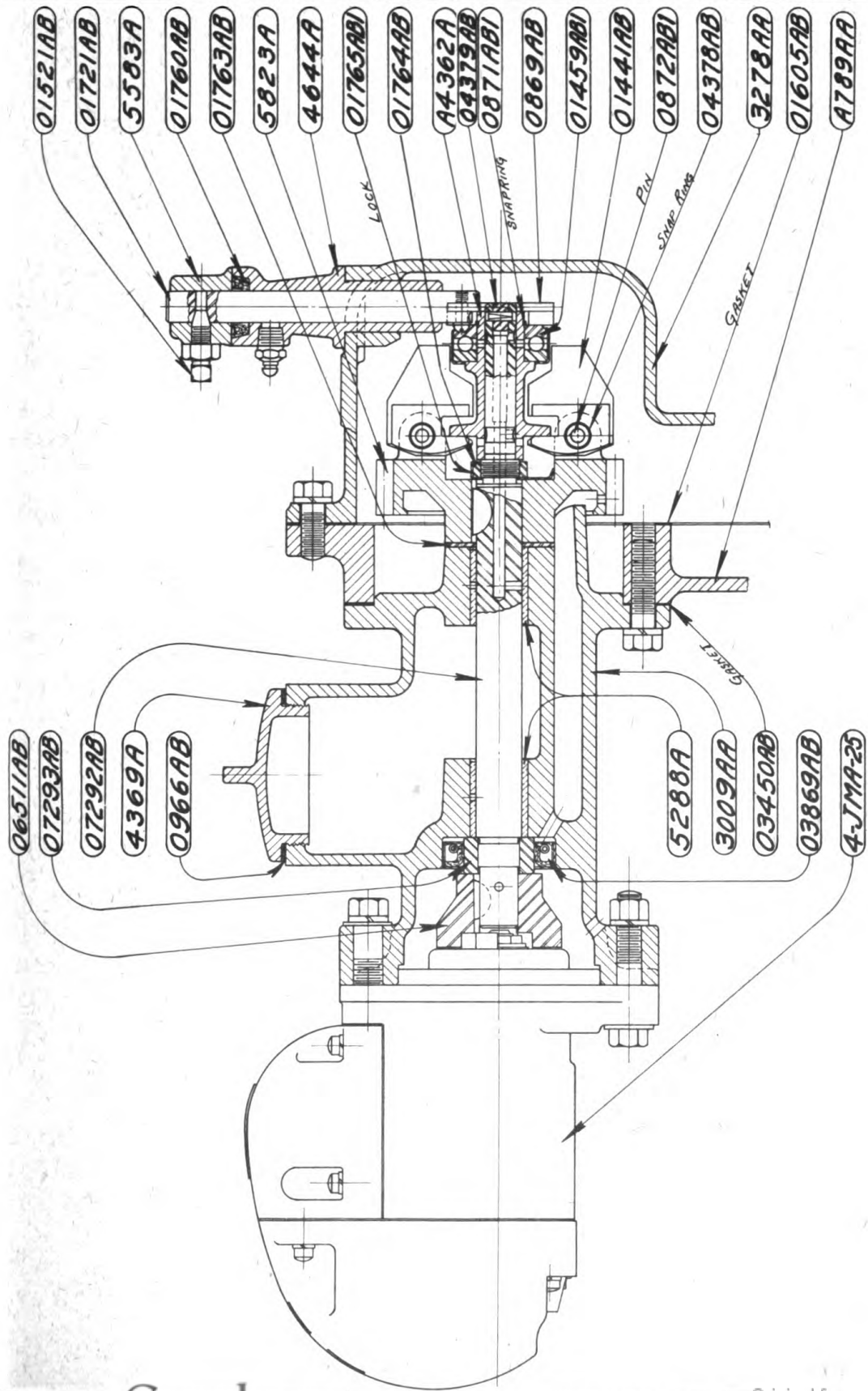
Unnumbered parts in illustrations are the same as corresponding parts shown with numbers.

GOVERNOR

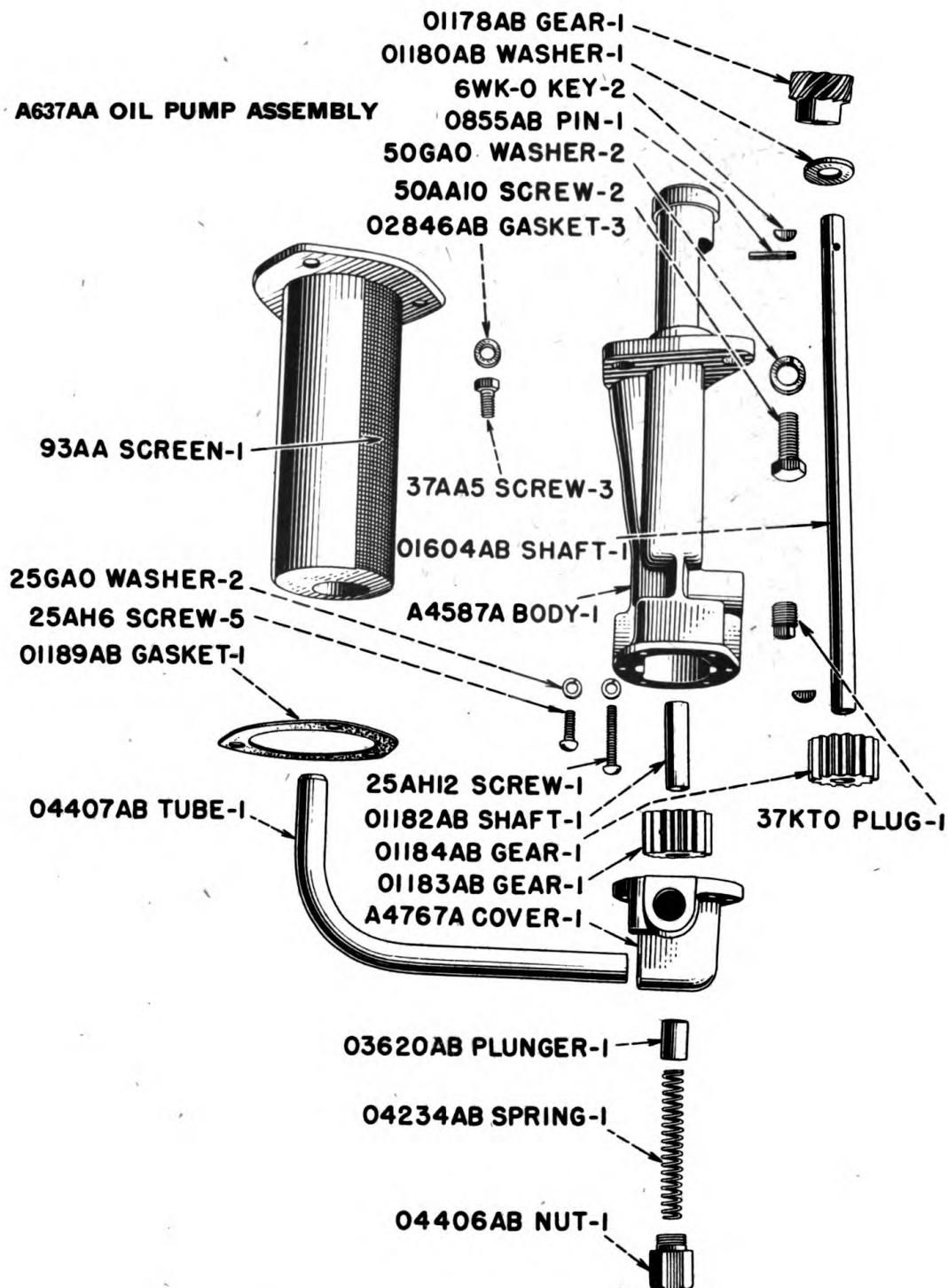


Unnumbered parts in illustrations are the same as corresponding parts shown with numbers.

GOVERNOR ASSEMBLY



OIL PUMP

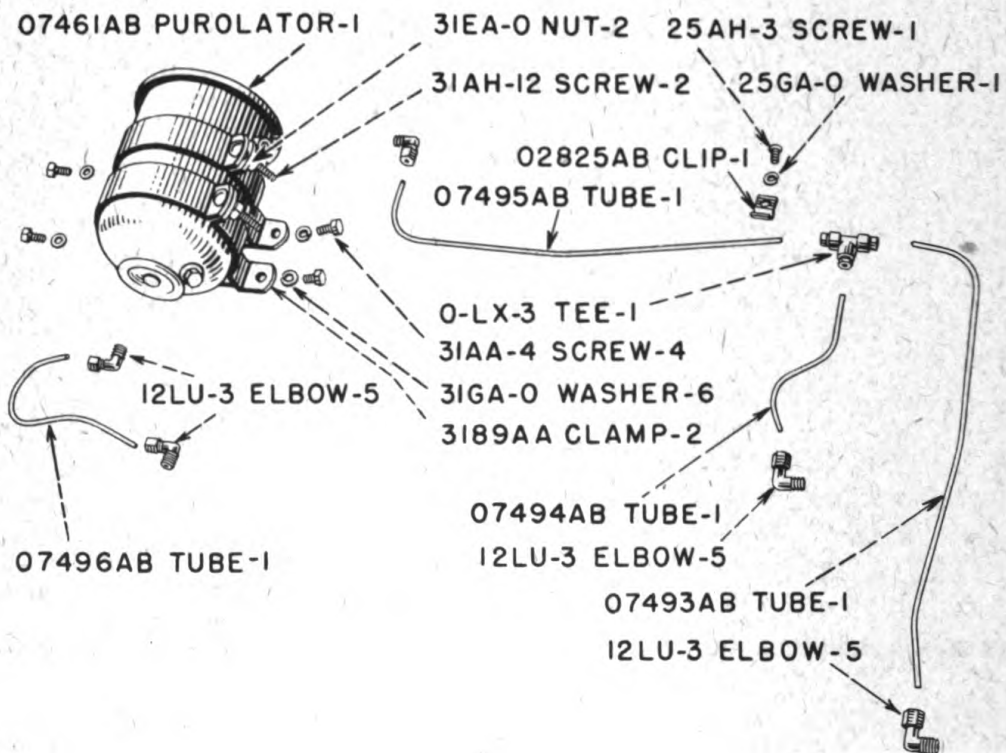


Unnumbered parts in illustrations are the same as corresponding parts shown with numbers.

THE COMPLETE OBSERVANCE of one simple rule would prevent many thousand serious injuries each year. THAT RULE IS: "NEVER ATTEMPT TO CLEAN, OIL, OR ADJUST A MACHINE WHILE IN MOTION.

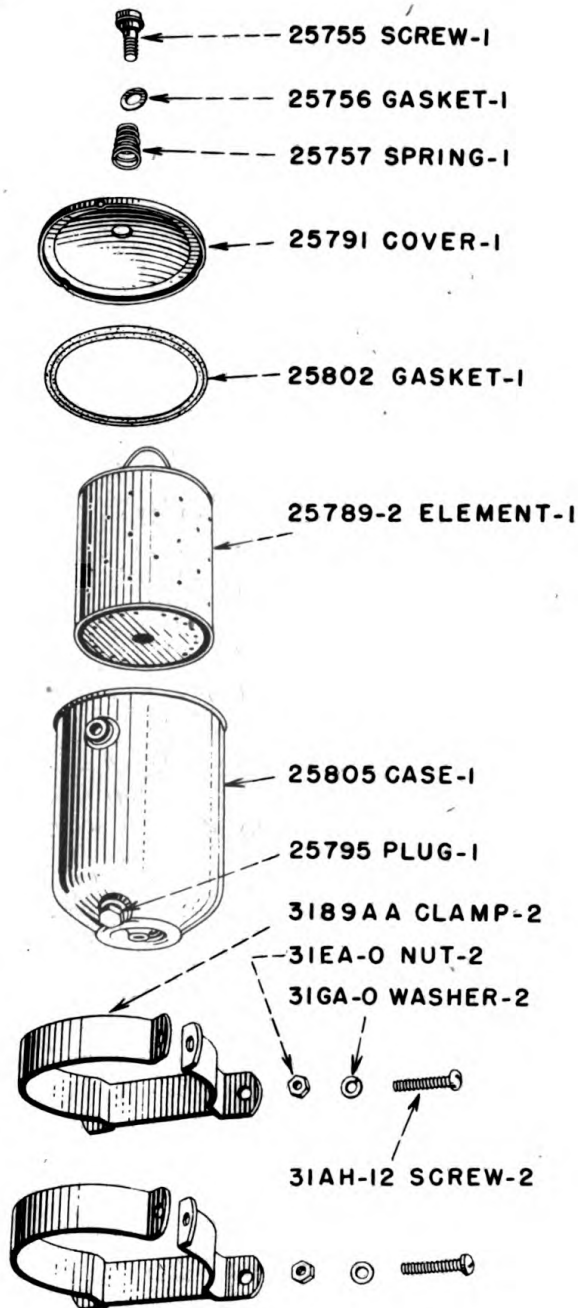
—National Safety Council.

OIL FILTER



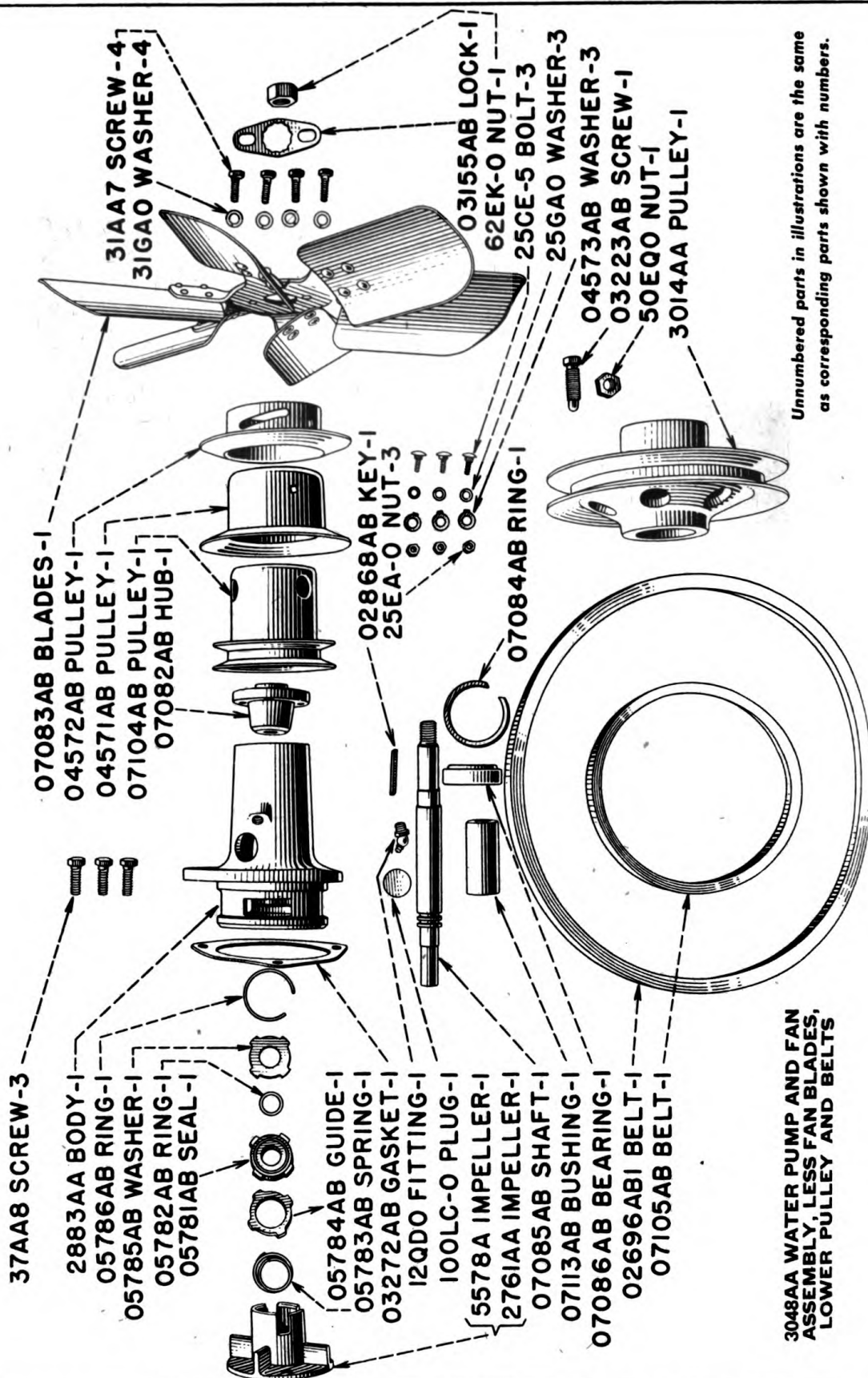
Unnumbered parts in illustrations are the same as corresponding parts shown with numbers.

OIL FILTER PARTS



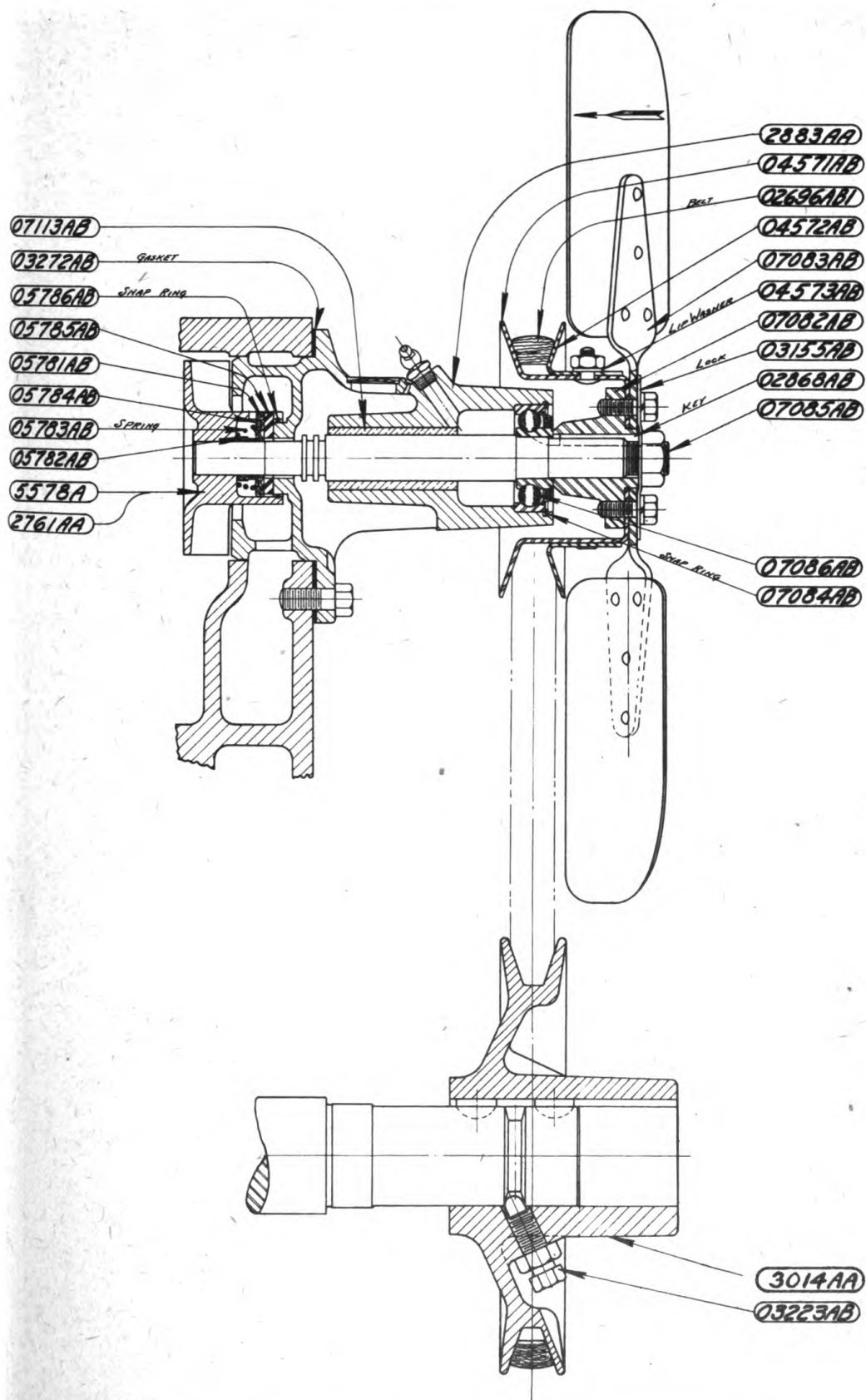
Unnumbered parts in illustrations are the same as corresponding parts shown with numbers.

FAN AND WATER PUMP

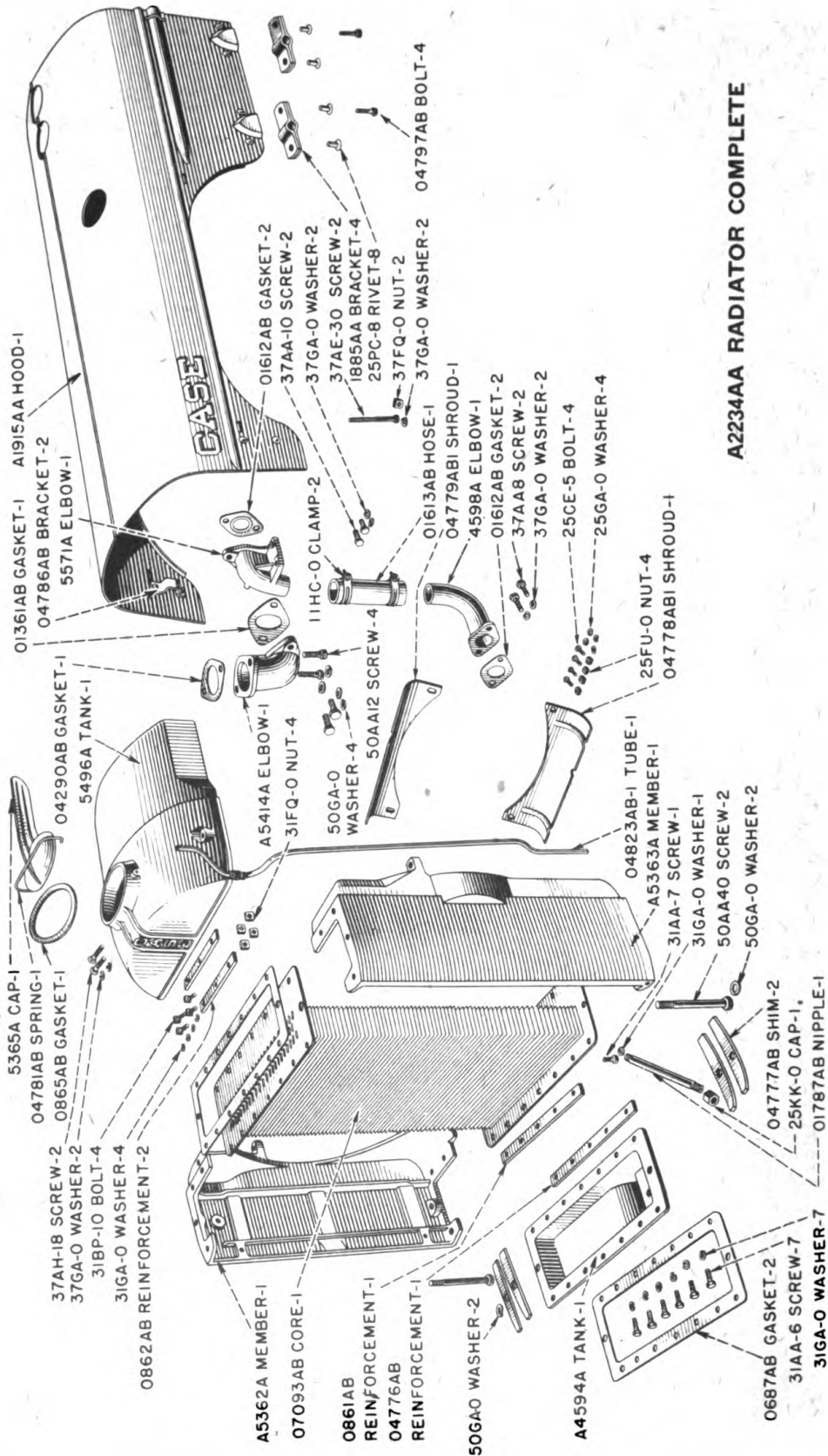


Unnumbered parts in illustrations are the same as corresponding parts shown with numbers.

FAN AND WATER PUMP ASSEMBLY



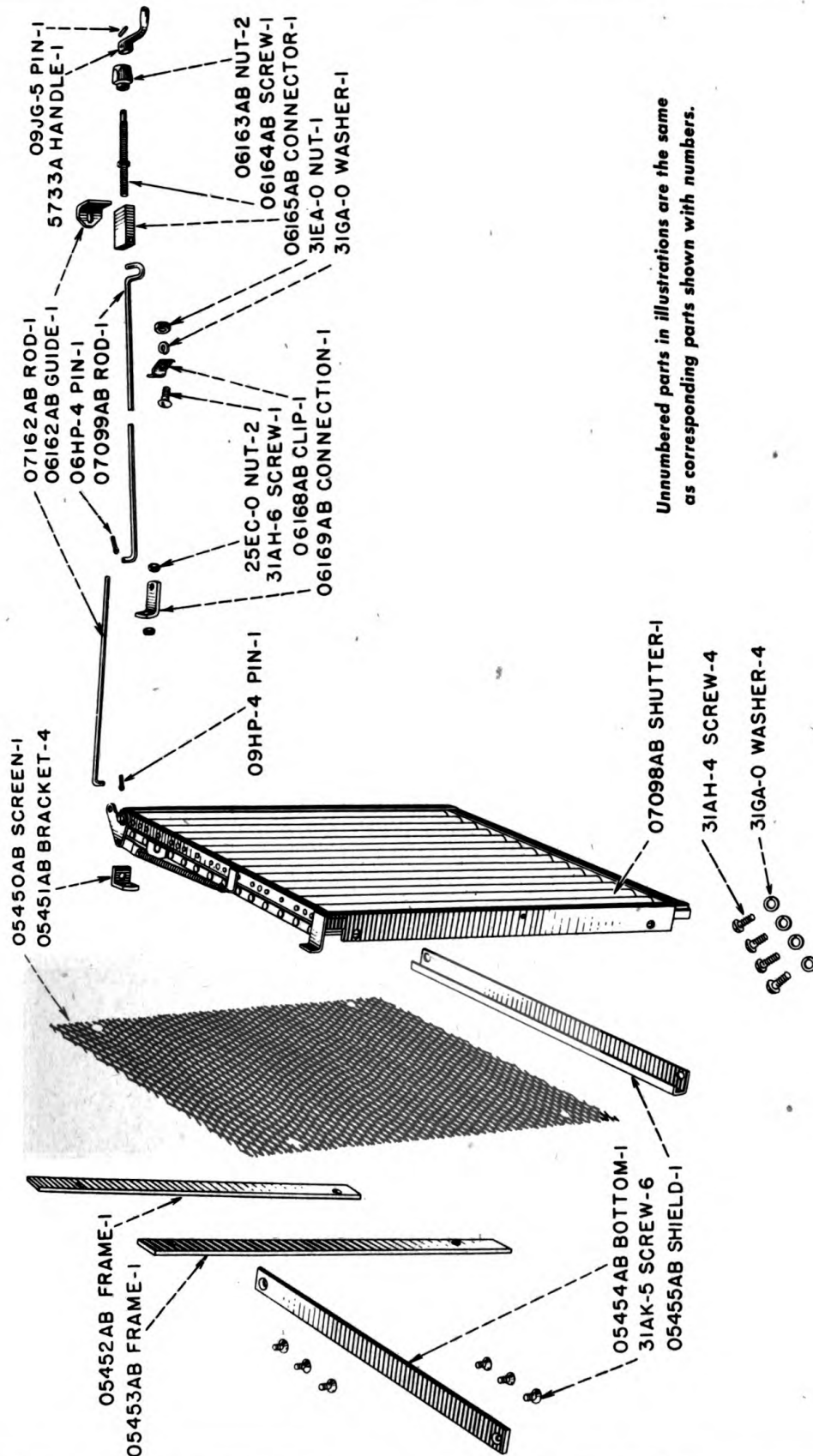
RADIATOR AND HOOD



A2234AA RADIATOR COMPLETE

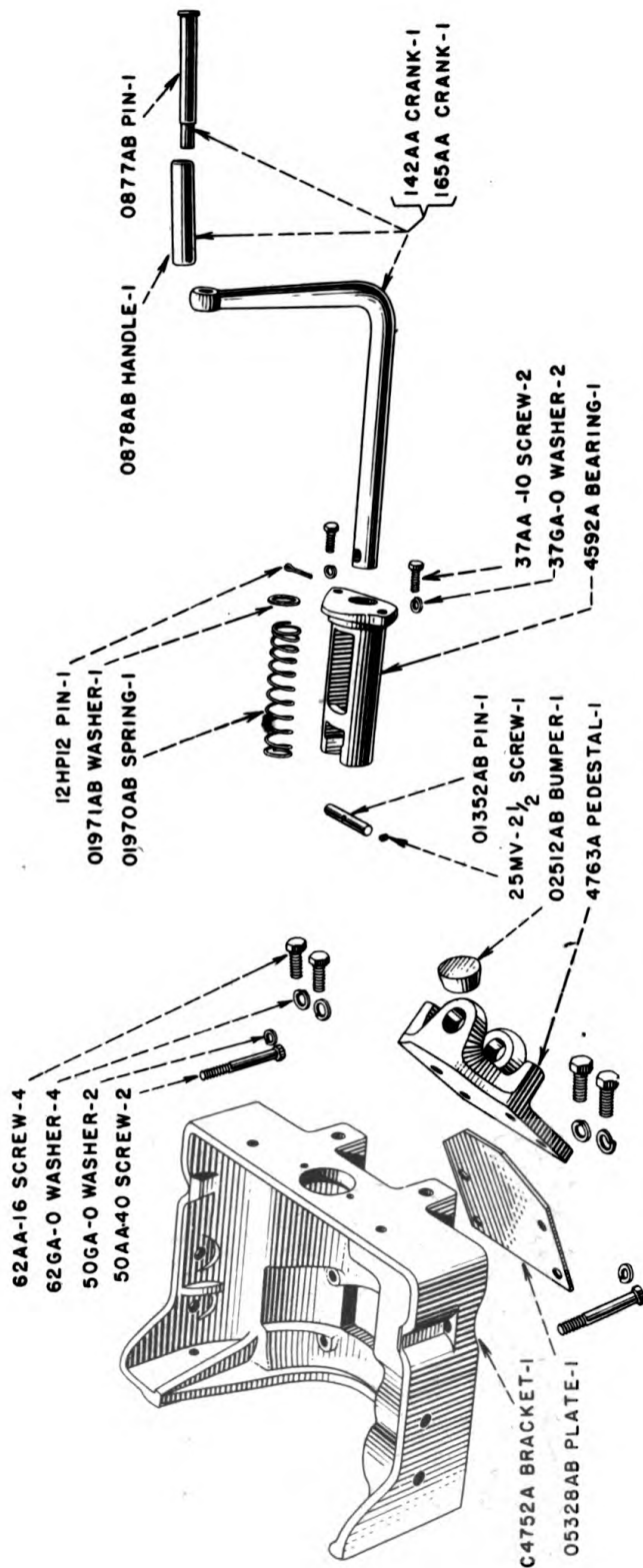
Unnumbered parts in illustrations are the same as corresponding parts shown with numbers.

RADIATOR SHUTTER AND SCREEN



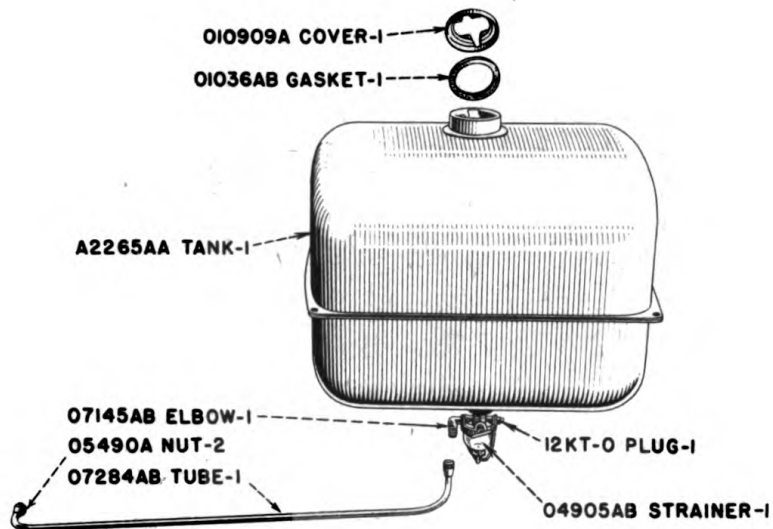
Unnumbered parts in illustrations are the same as corresponding parts shown with numbers.

STARTING CRANK AND RADIATOR BRACKET

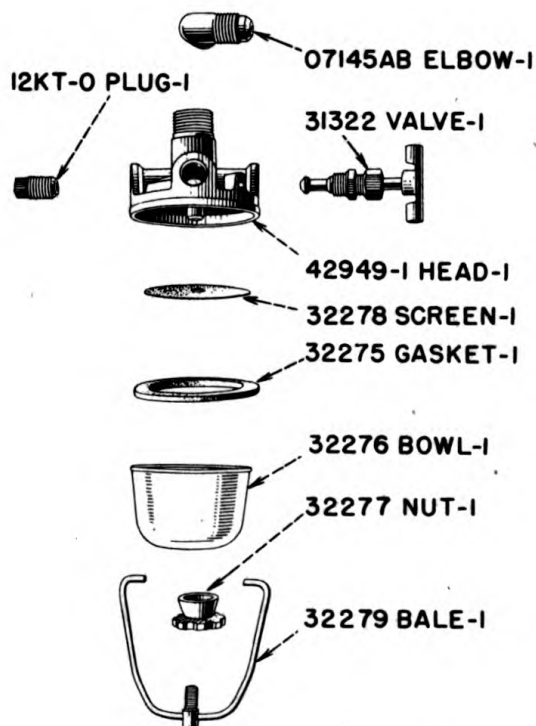


Unnumbered parts in illustrations are the same as corresponding parts shown with numbers.

FUEL TANK

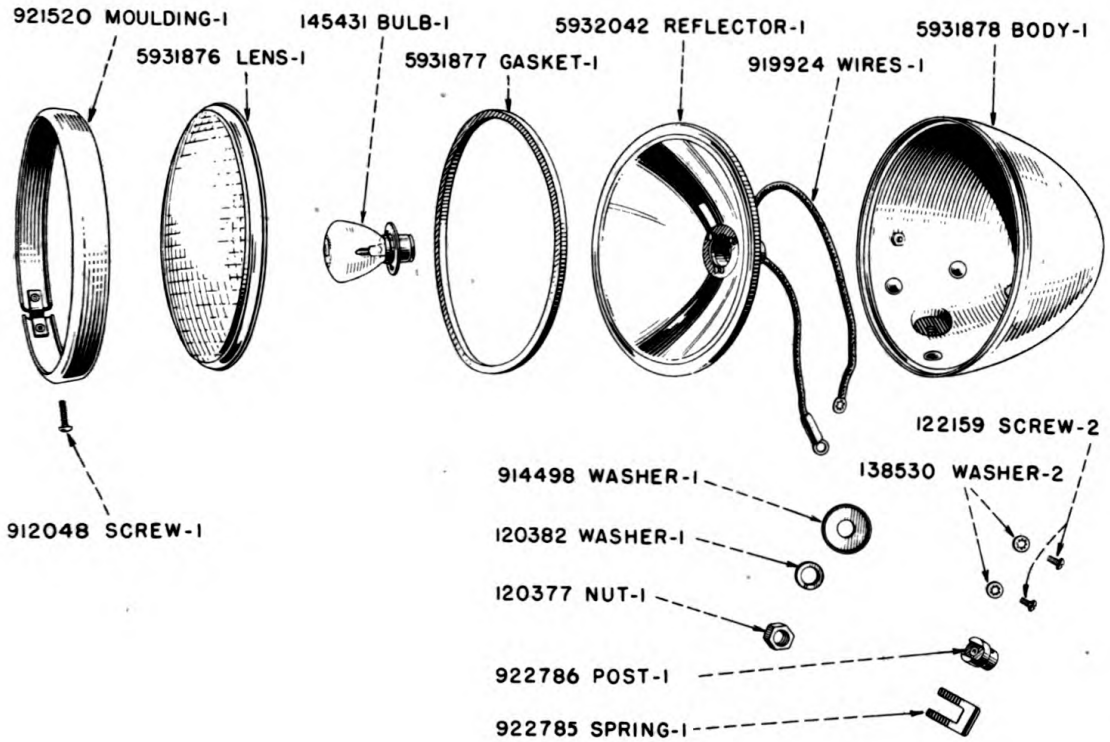


FUEL STRAINER

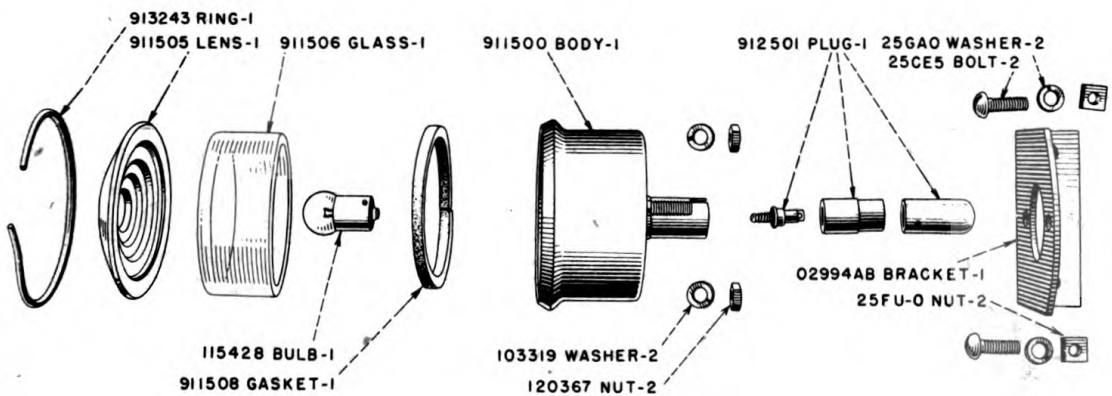


Unnumbered parts in illustrations are the same as corresponding parts shown with numbers.

HEAD LAMP PARTS

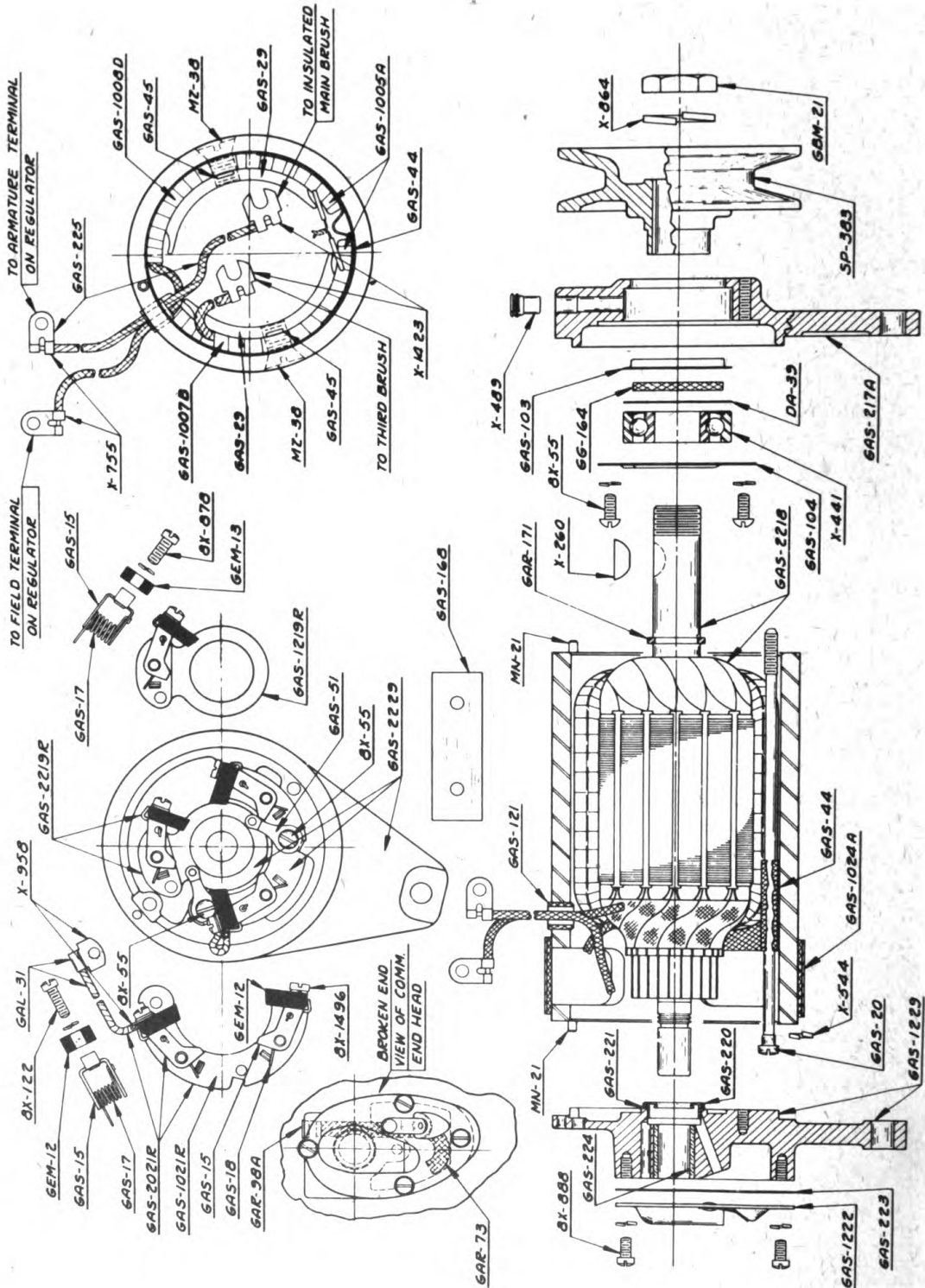


TAIL LAMP

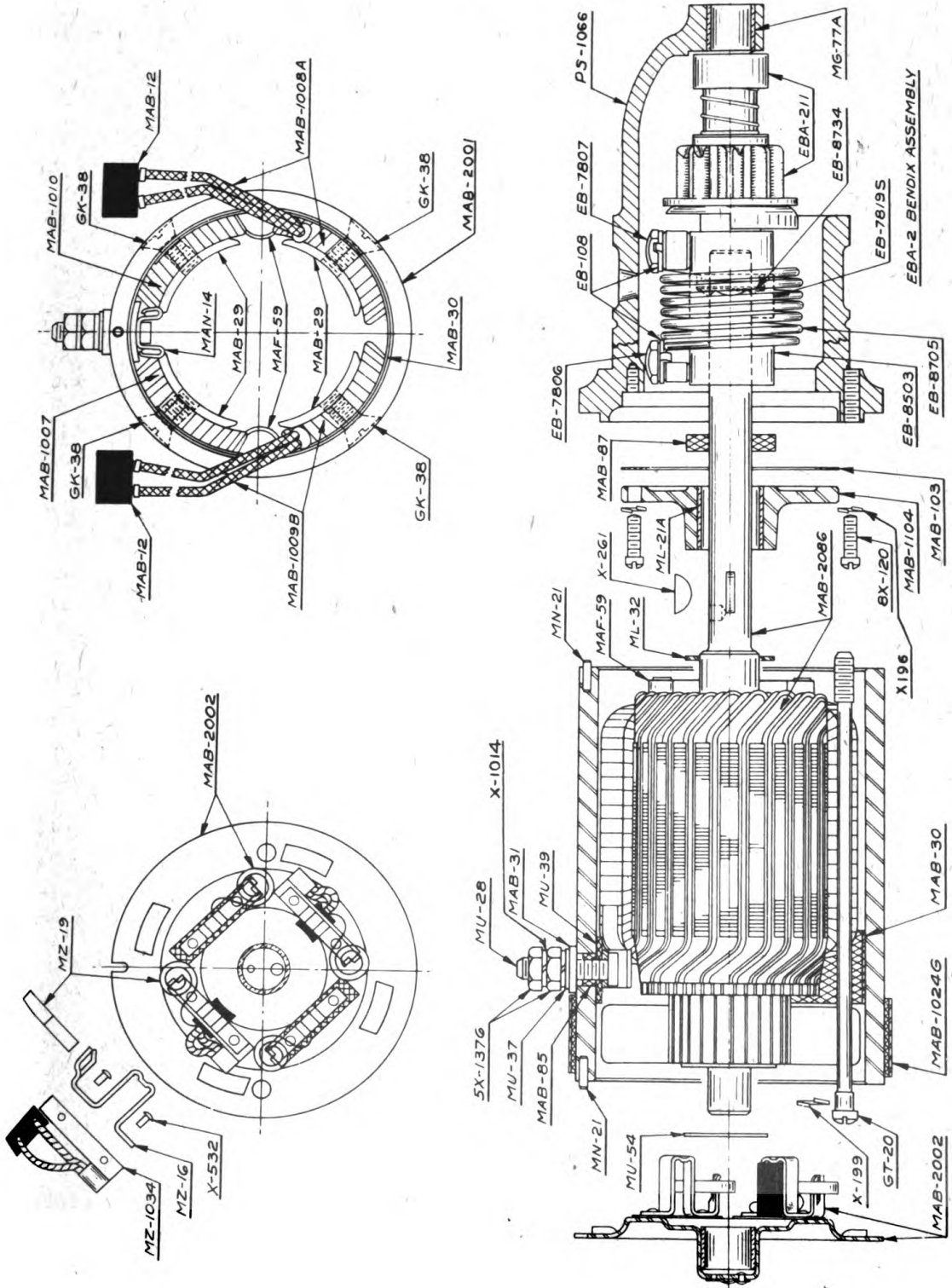


Unnumbered parts in illustrations are the same as corresponding parts shown with numbers.

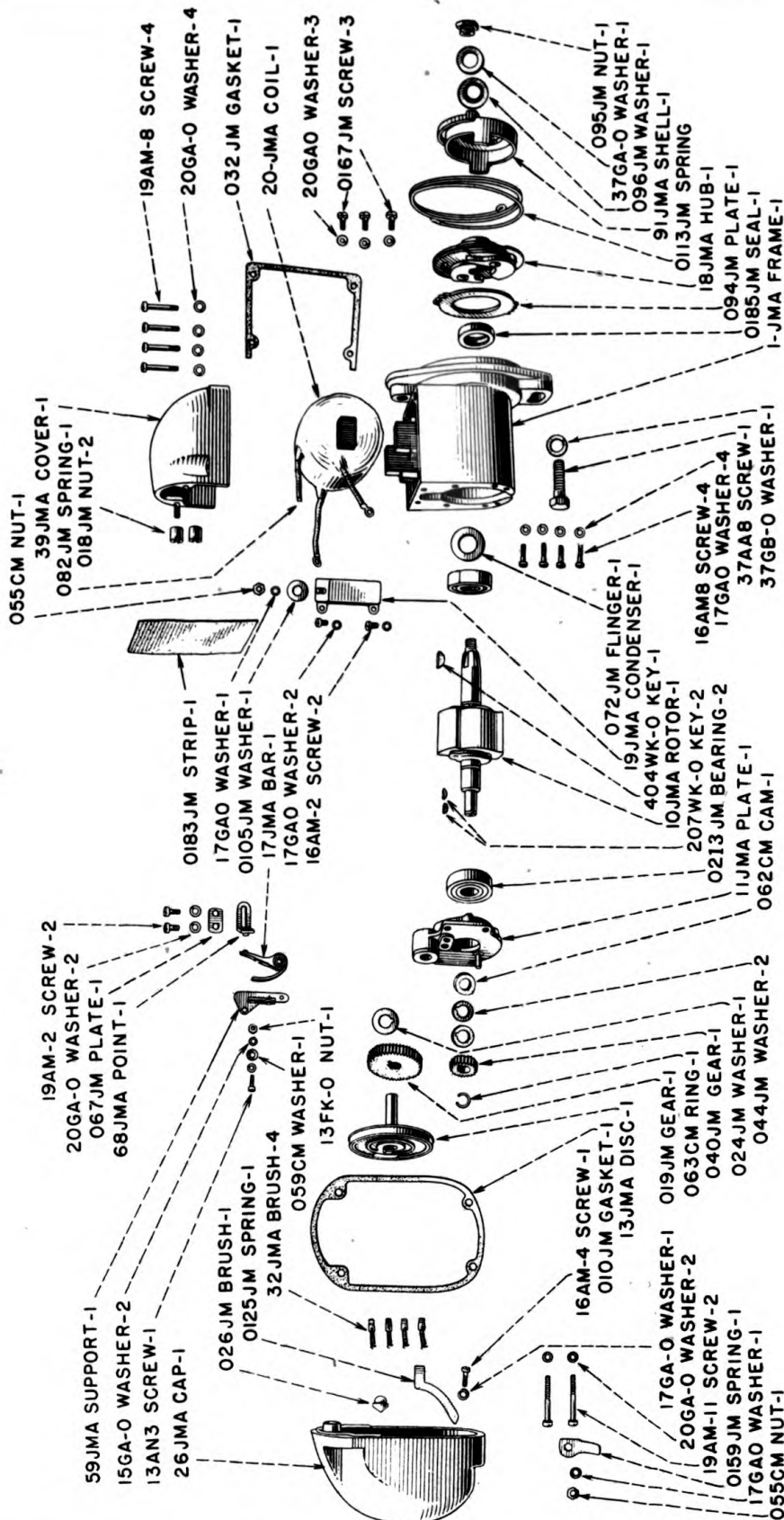
GENERATOR (GAS-4167)



STARTING MOTOR (MAB-4105)



4JMA-25 "CASE" MAGNETO



Unnumbered parts in illustrations are the same as corresponding parts shown with numbers.

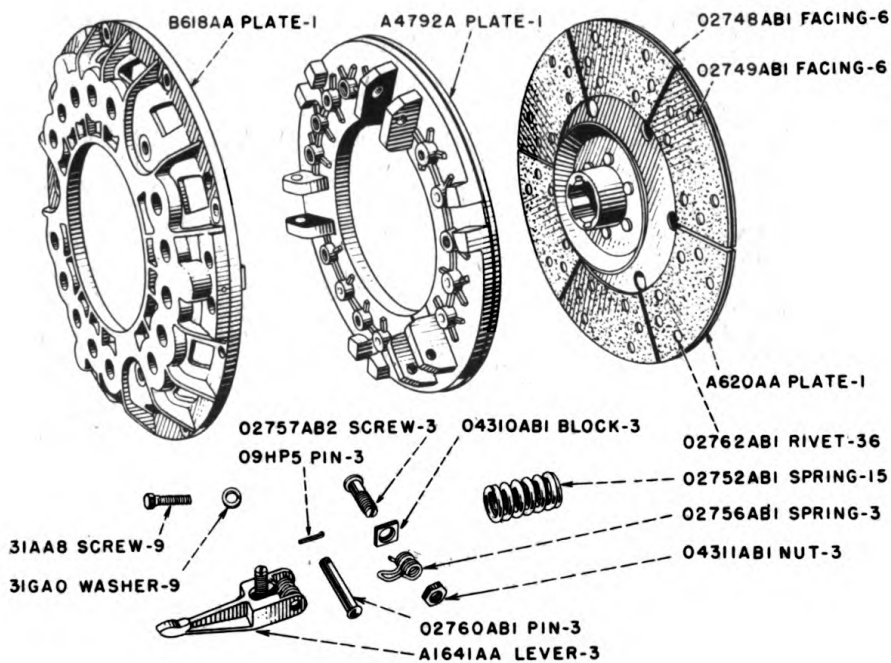
A Careful Operator

**IS THE BEST INSURANCE
AGAINST AN ACCIDENT**

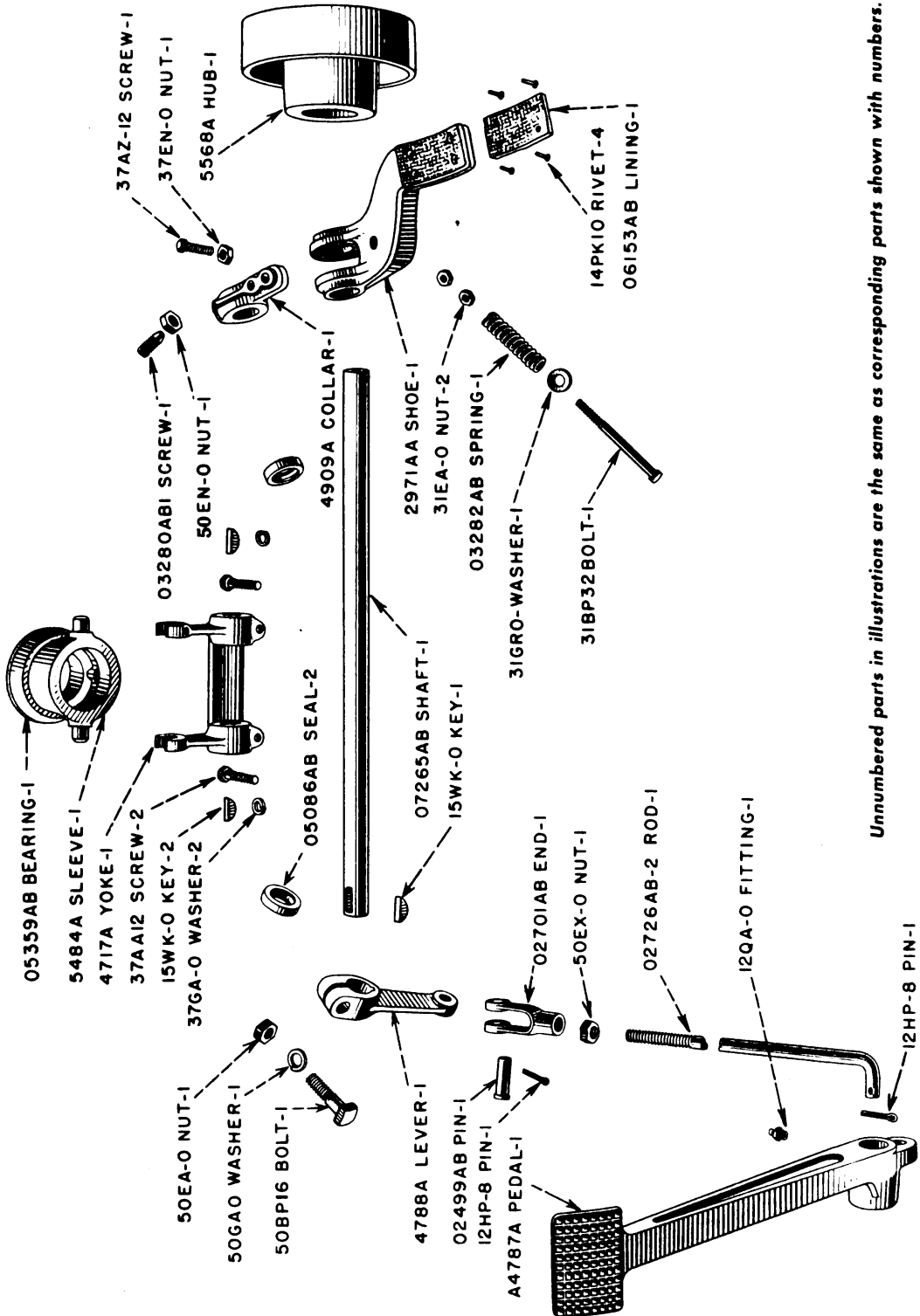
—National Safety Council.

CLUTCH

2173AA CLUTCH COMPLETE

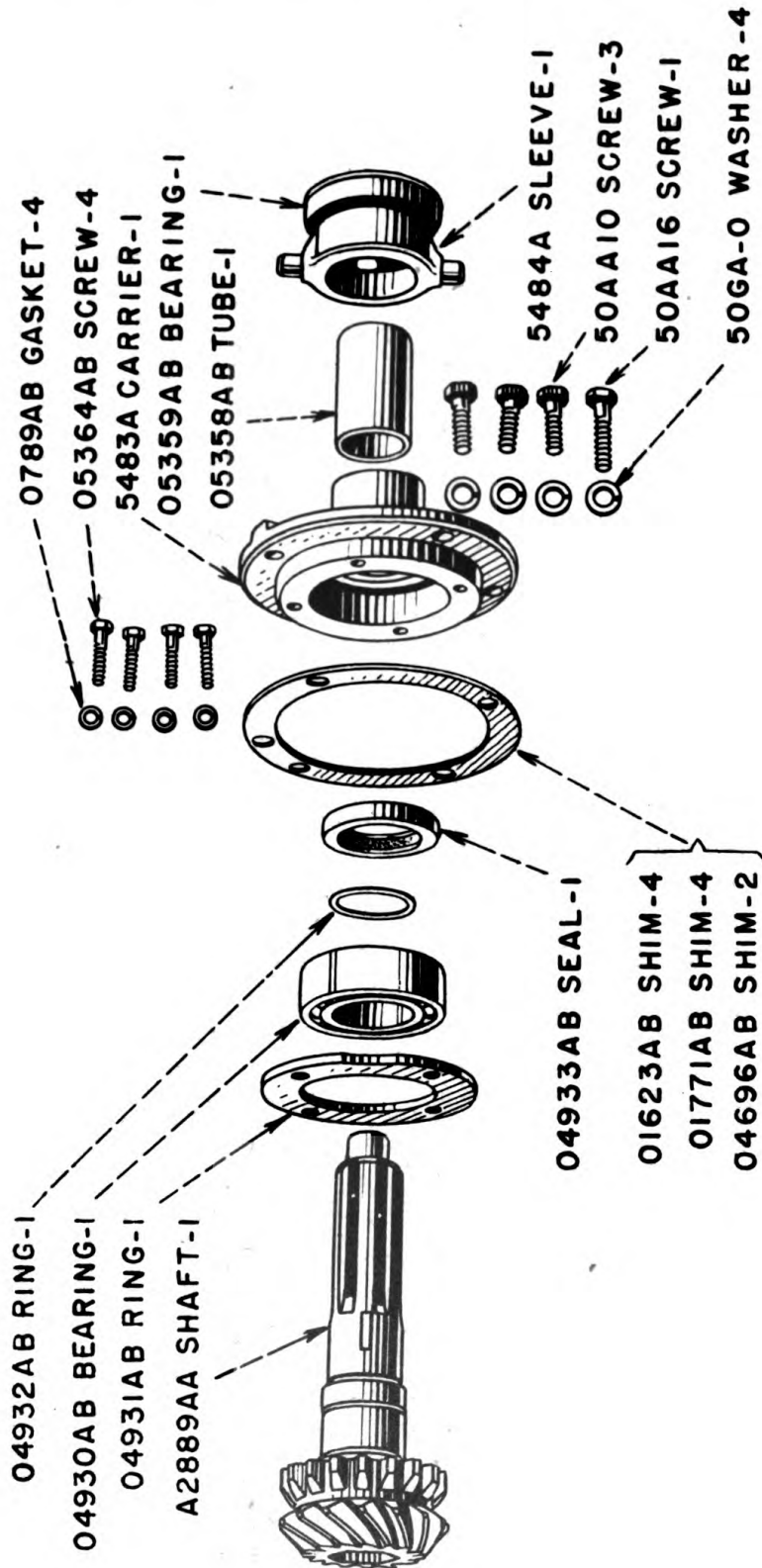


CLUTCH THROWOUT PARTS



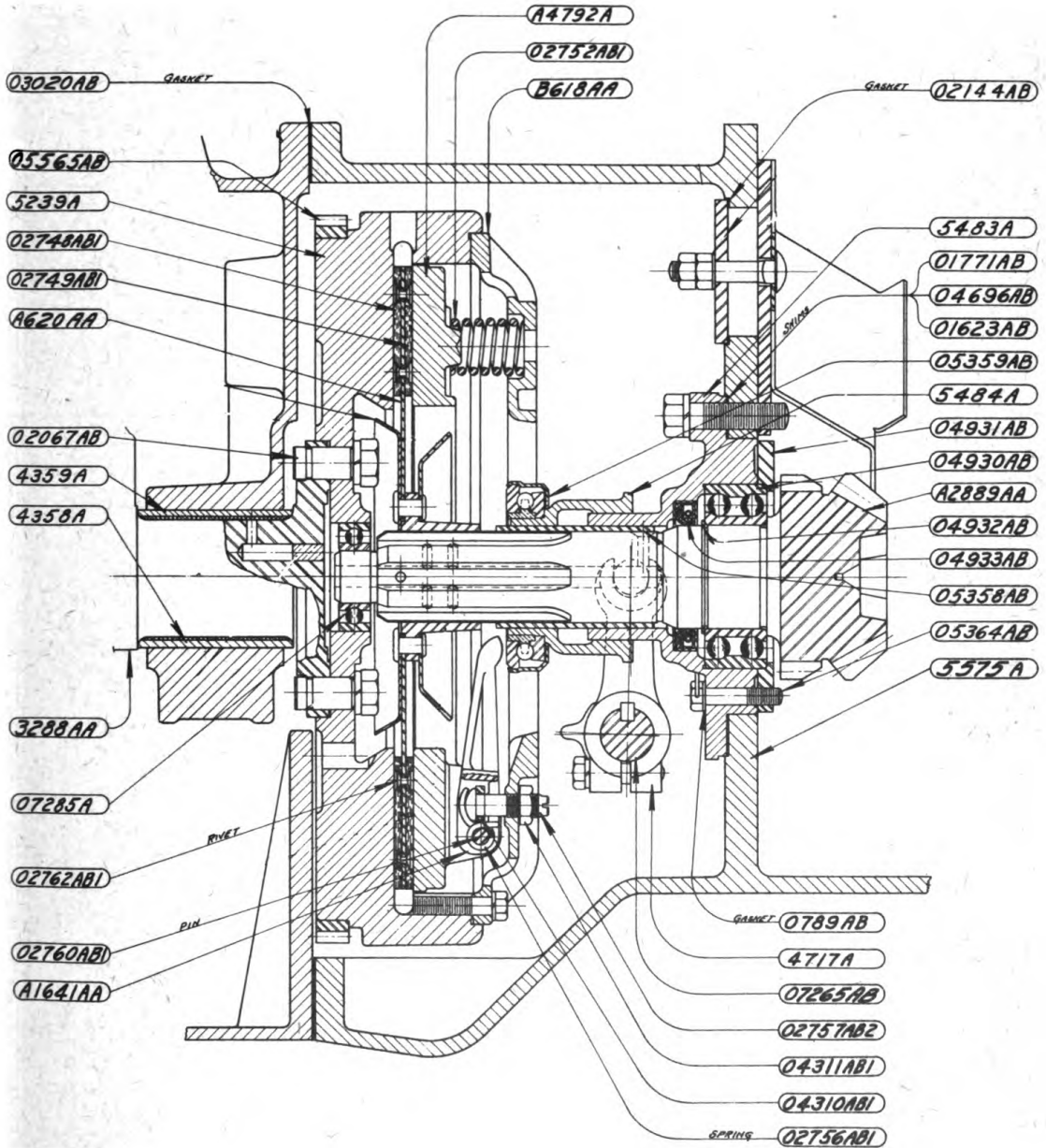
Unnumbered parts in illustrations are the same as corresponding parts shown with numbers.

CLUTCH SHAFT



Unnumbered parts in illustrations are the same as corresponding parts shown with numbers.

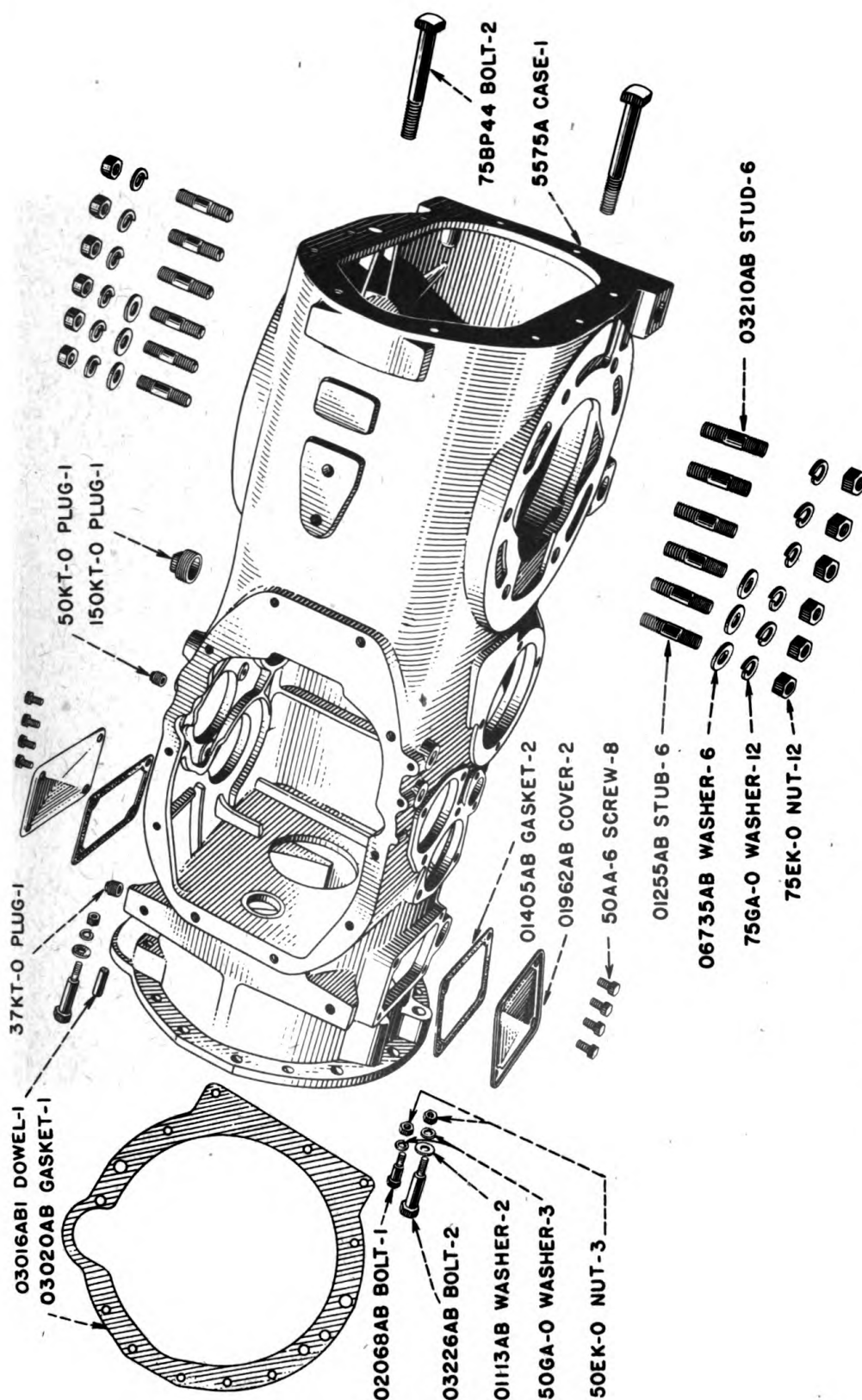
CLUTCH ASSEMBLY



THE COMPLETE OBSERVANCE of one simple rule would prevent many thousand serious injuries each year. THAT RULE IS: "NEVER ATTEMPT TO CLEAN, OIL, OR ADJUST A MACHINE WHILE IN MOTION."

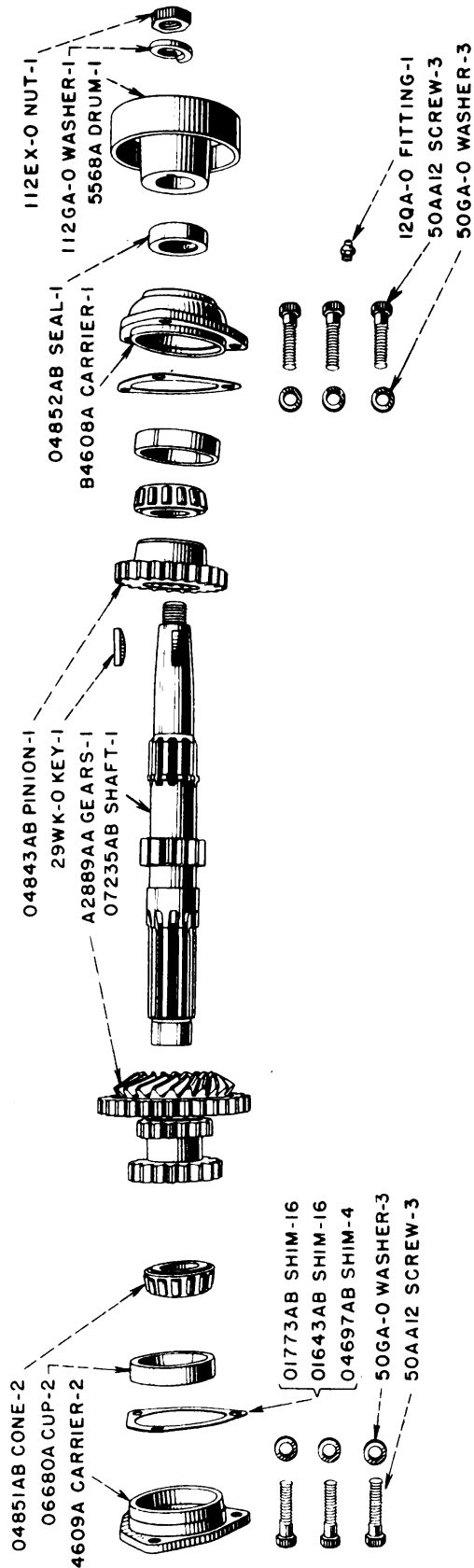
—National Safety Council.

TRANSMISSION



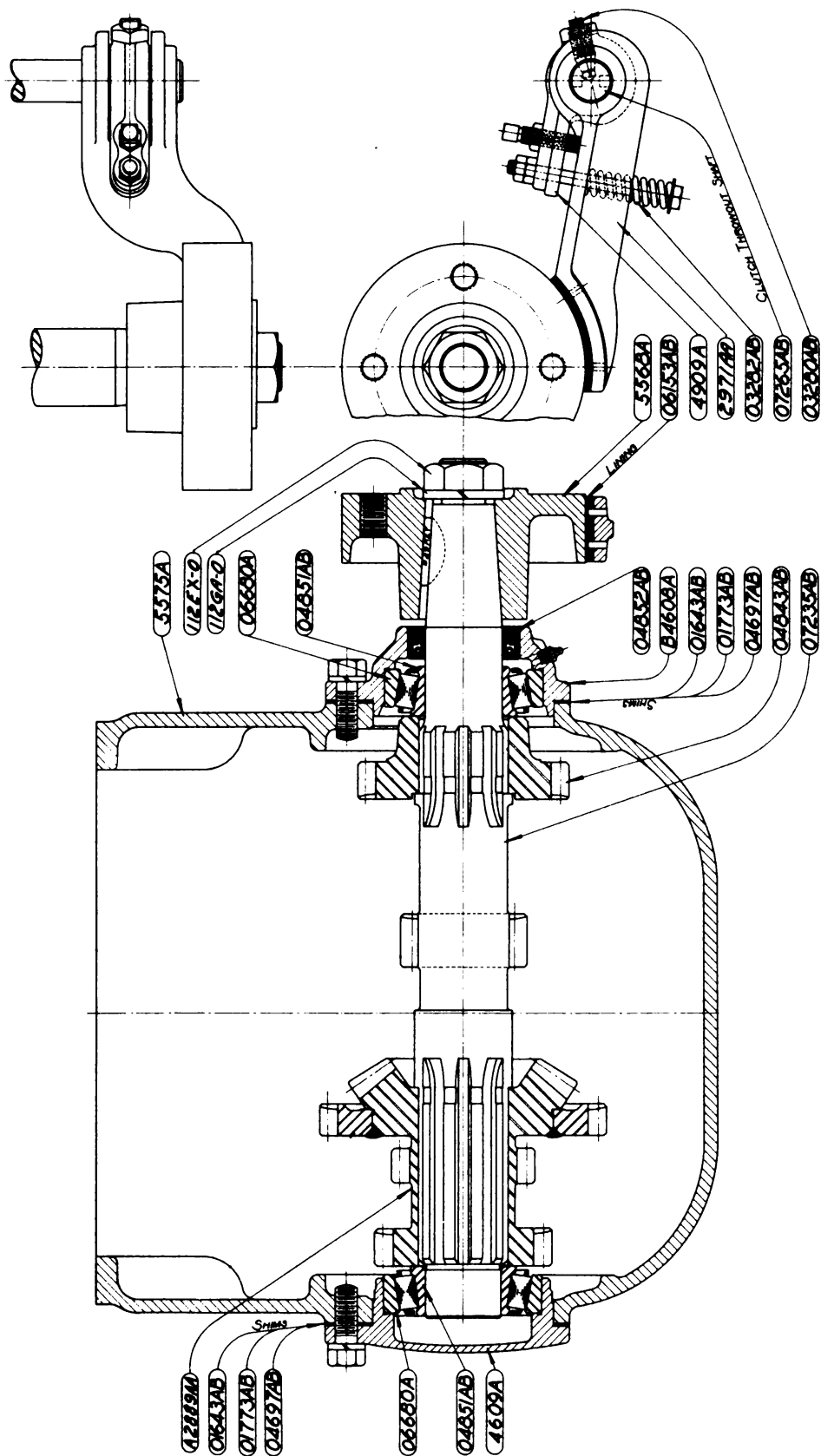
Unnumbered parts in illustrations are the same as corresponding parts shown with numbers.

TRANSMISSION FIRST REDUCTION SHAFT

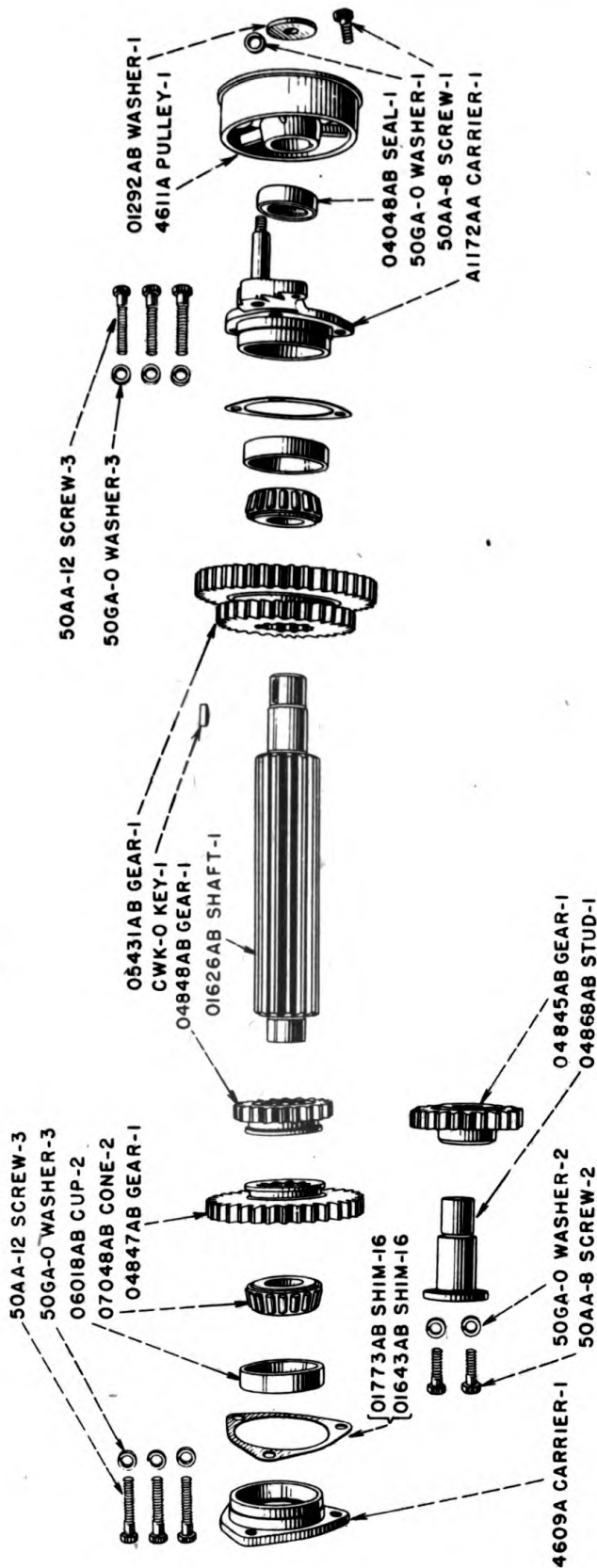


Unnumbered parts in illustrations are the same as corresponding parts shown with numbers.

FIRST REDUCTION SHAFT ASSEMBLY

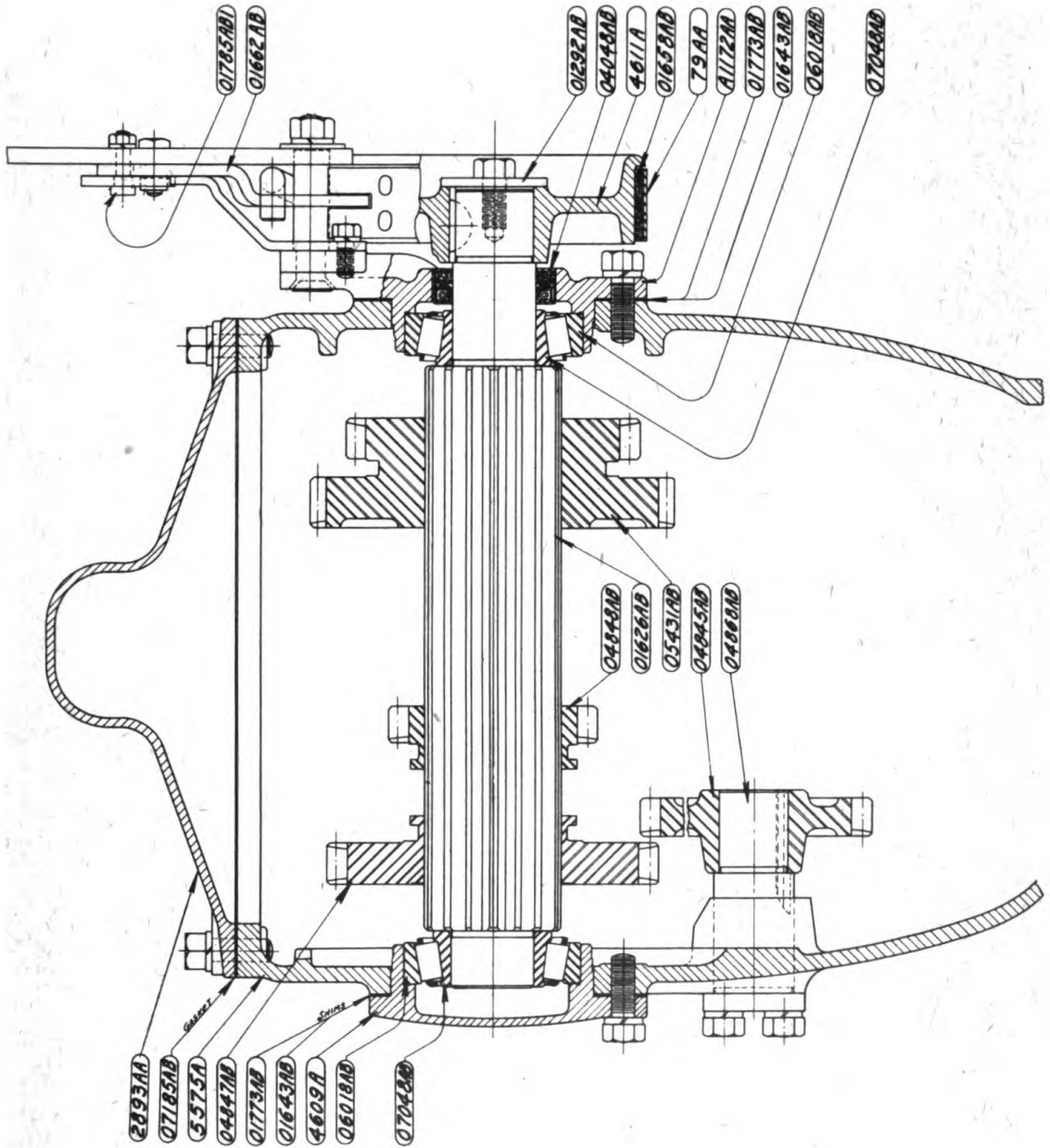


TRANSMISSION SLIDING GEAR SHAFT

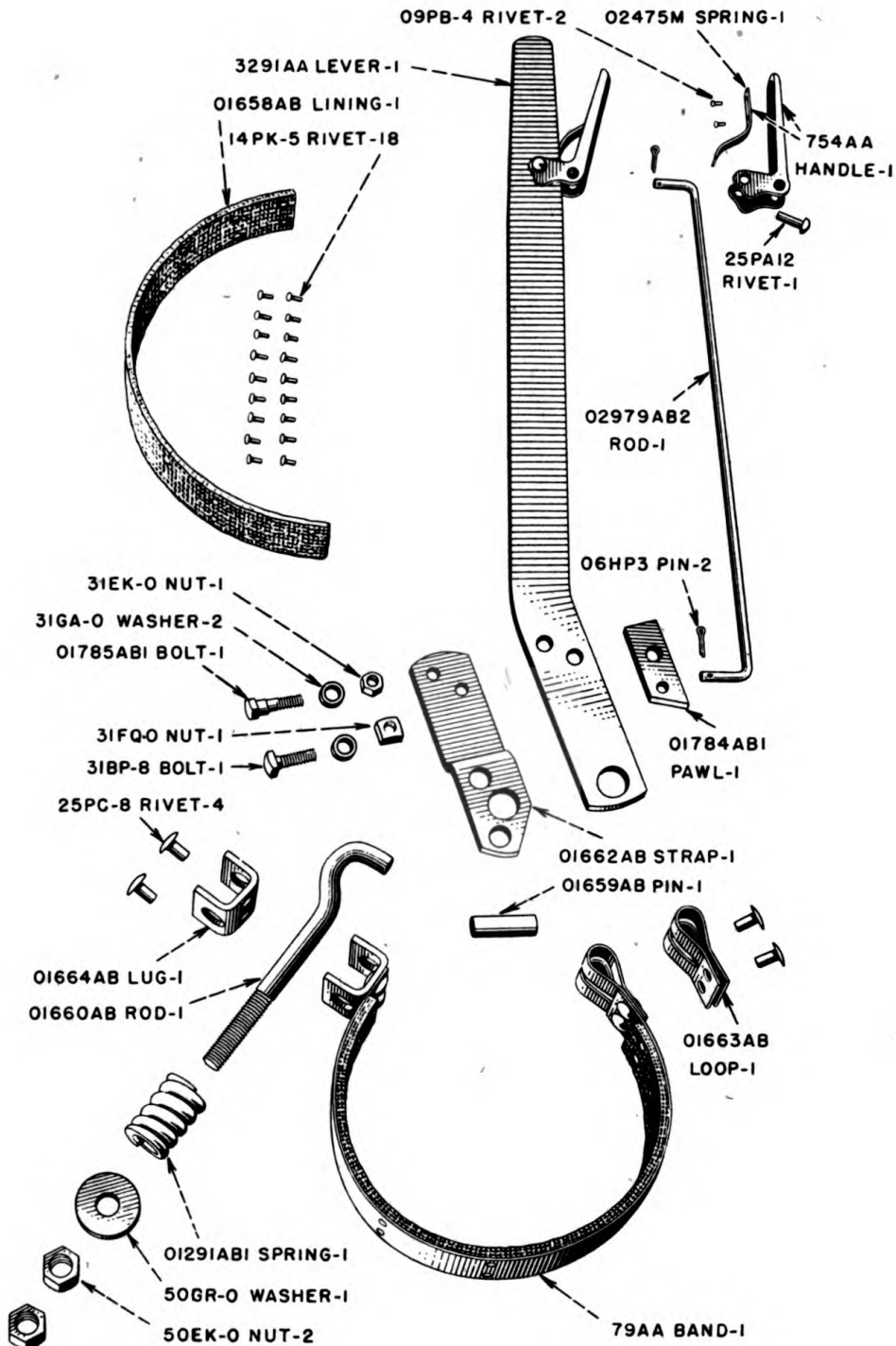


Unnumbered parts in illustrations are the same as corresponding parts shown with numbers.

SLIDING GEAR SHAFT ASSEMBLY

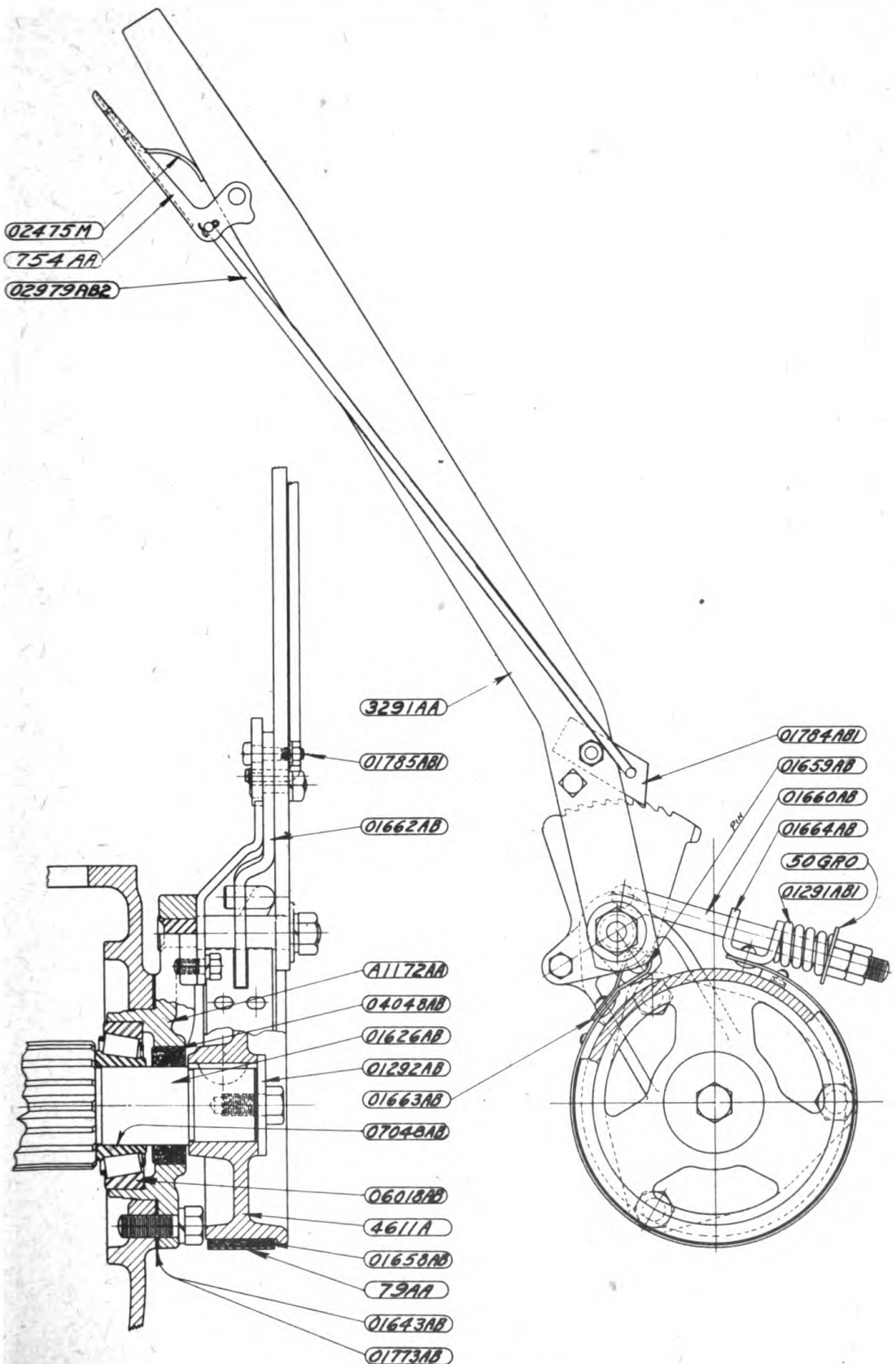


HAND BRAKE

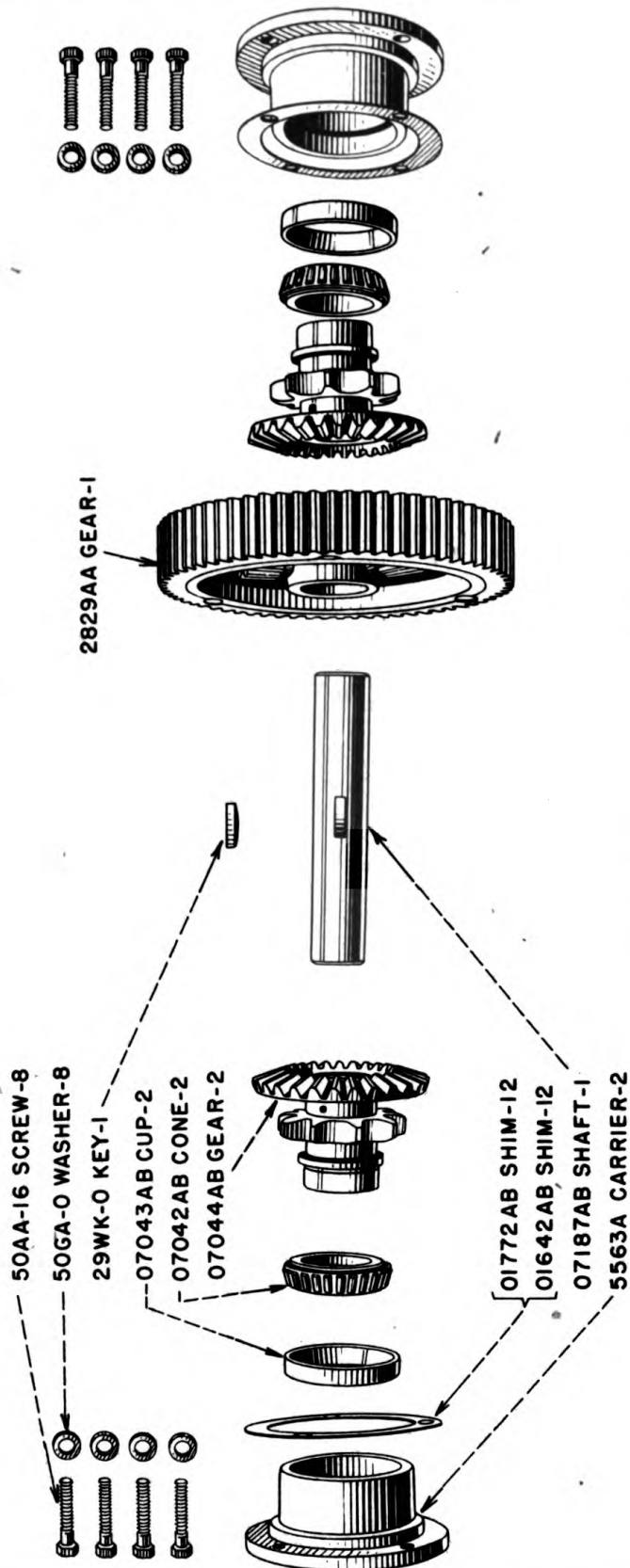


Unnumbered parts in illustrations are the same as corresponding parts shown with numbers.

HAND BRAKE ASSEMBLY

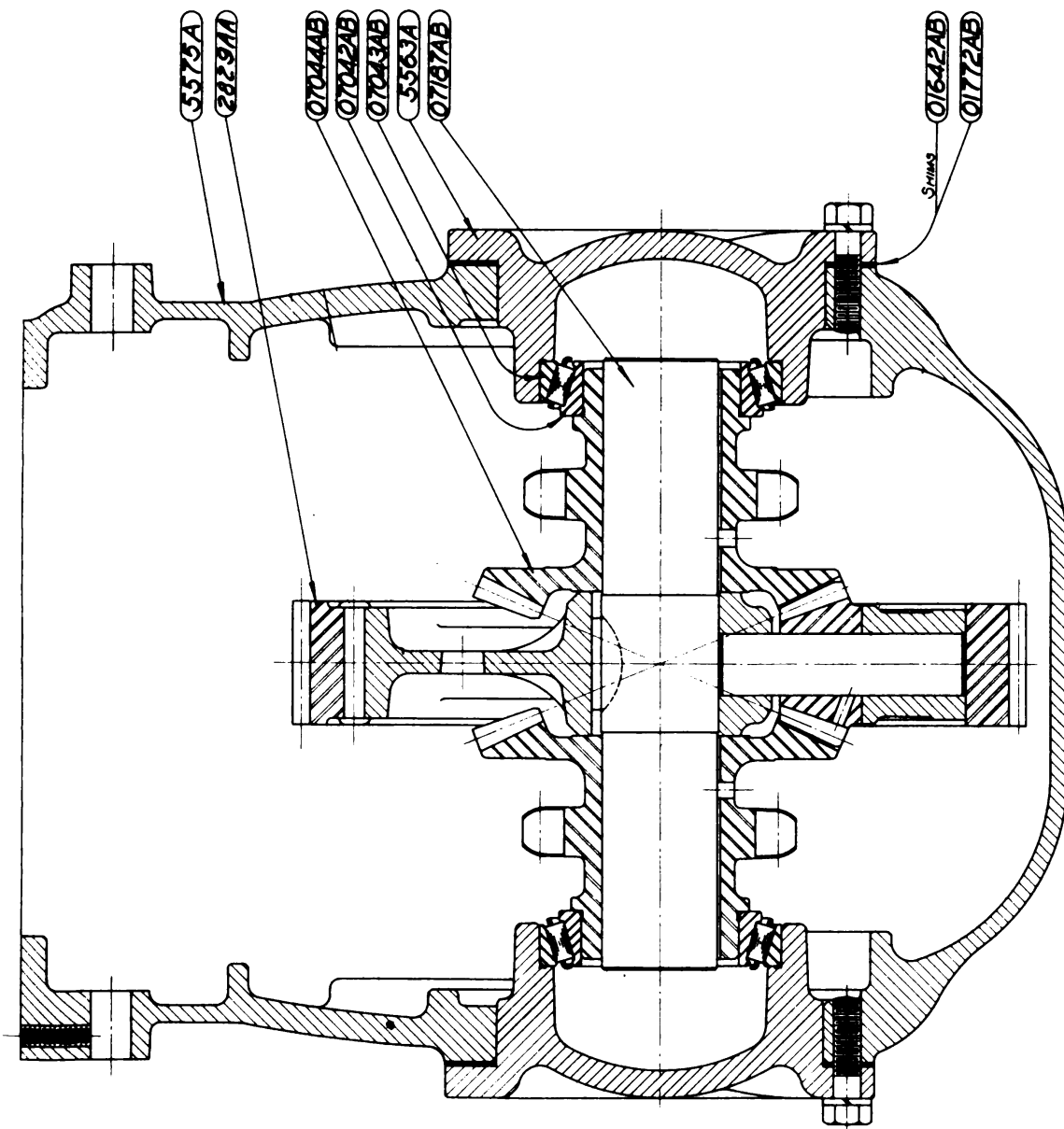


TRANSMISSION DIFFERENTIAL SHAFT

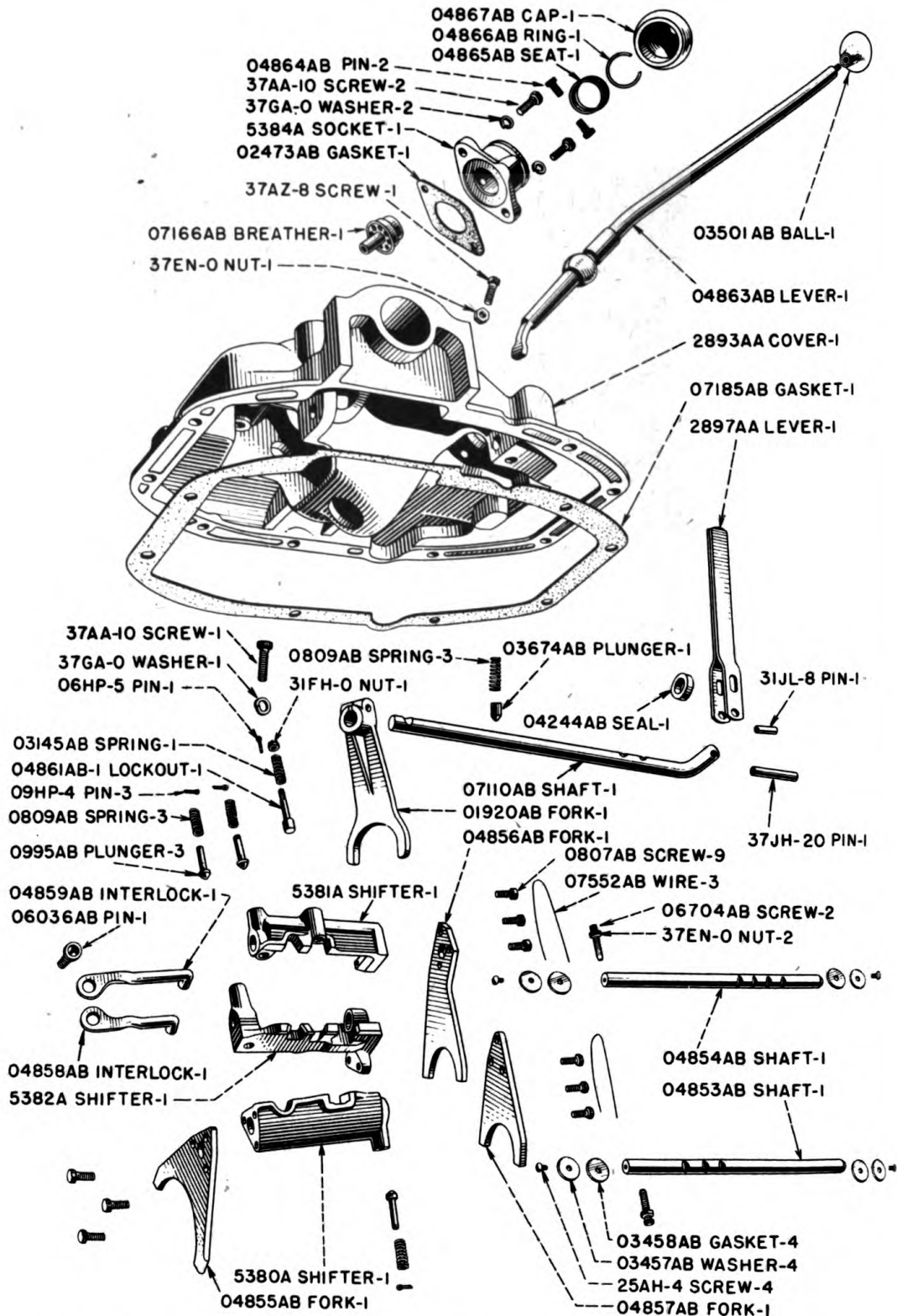


Unnumbered parts in illustrations are the same as corresponding parts shown with numbers.

DIFFERENTIAL SHAFT ASSEMBLY

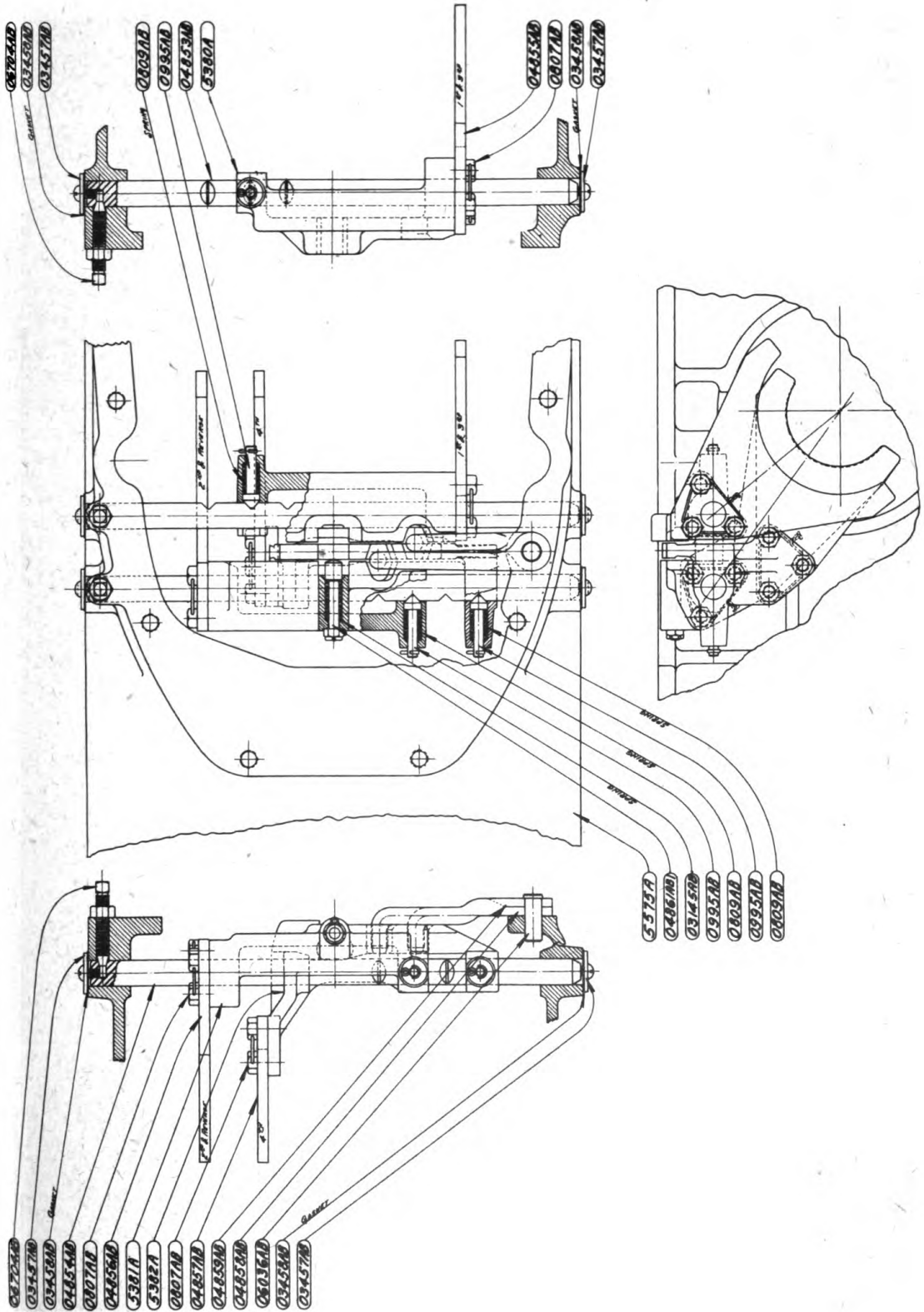


GEAR SHIFT PARTS



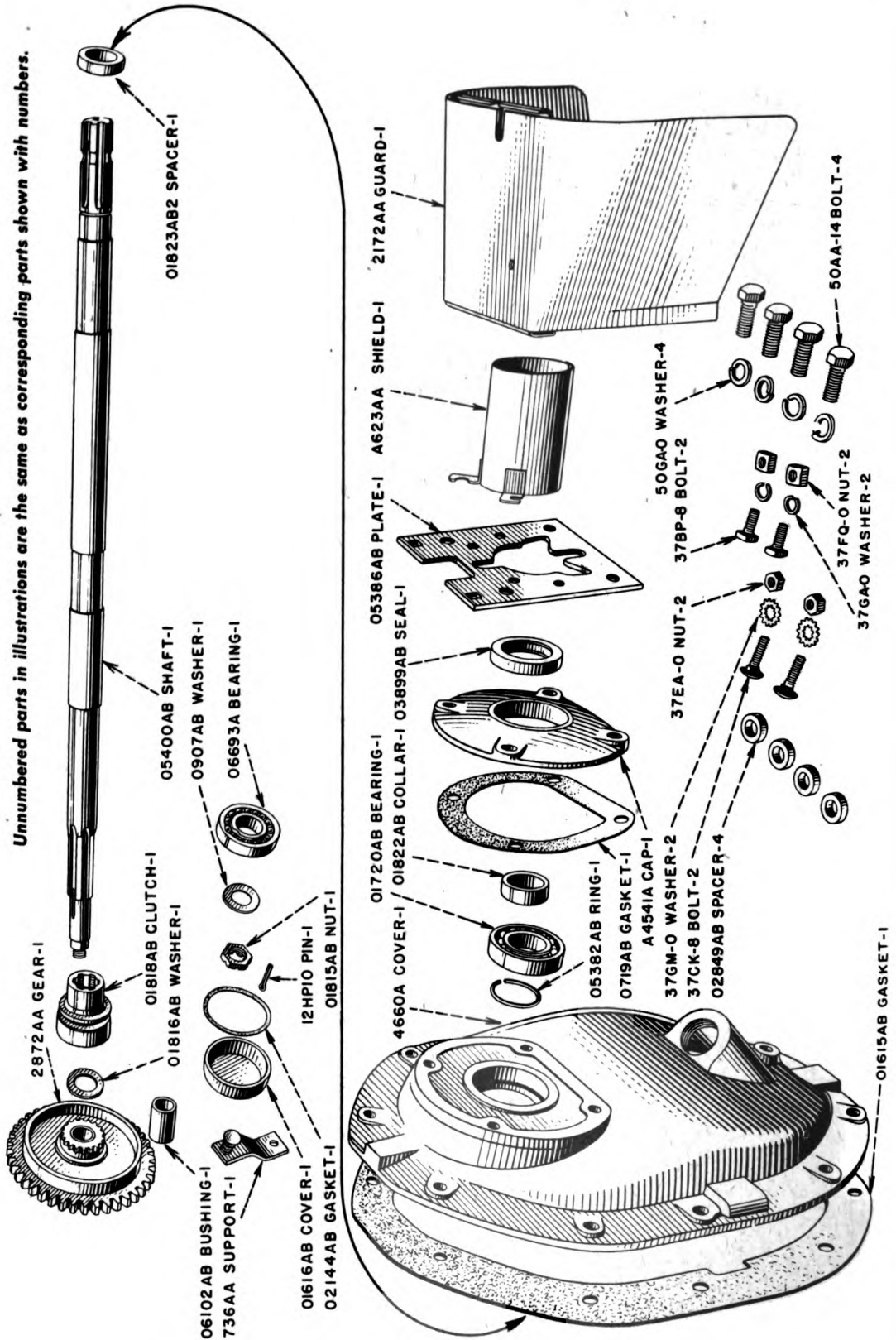
Unnumbered parts in illustrations are the same as corresponding parts shown with numbers.

SHIFTER SHAFT ASSEMBLY

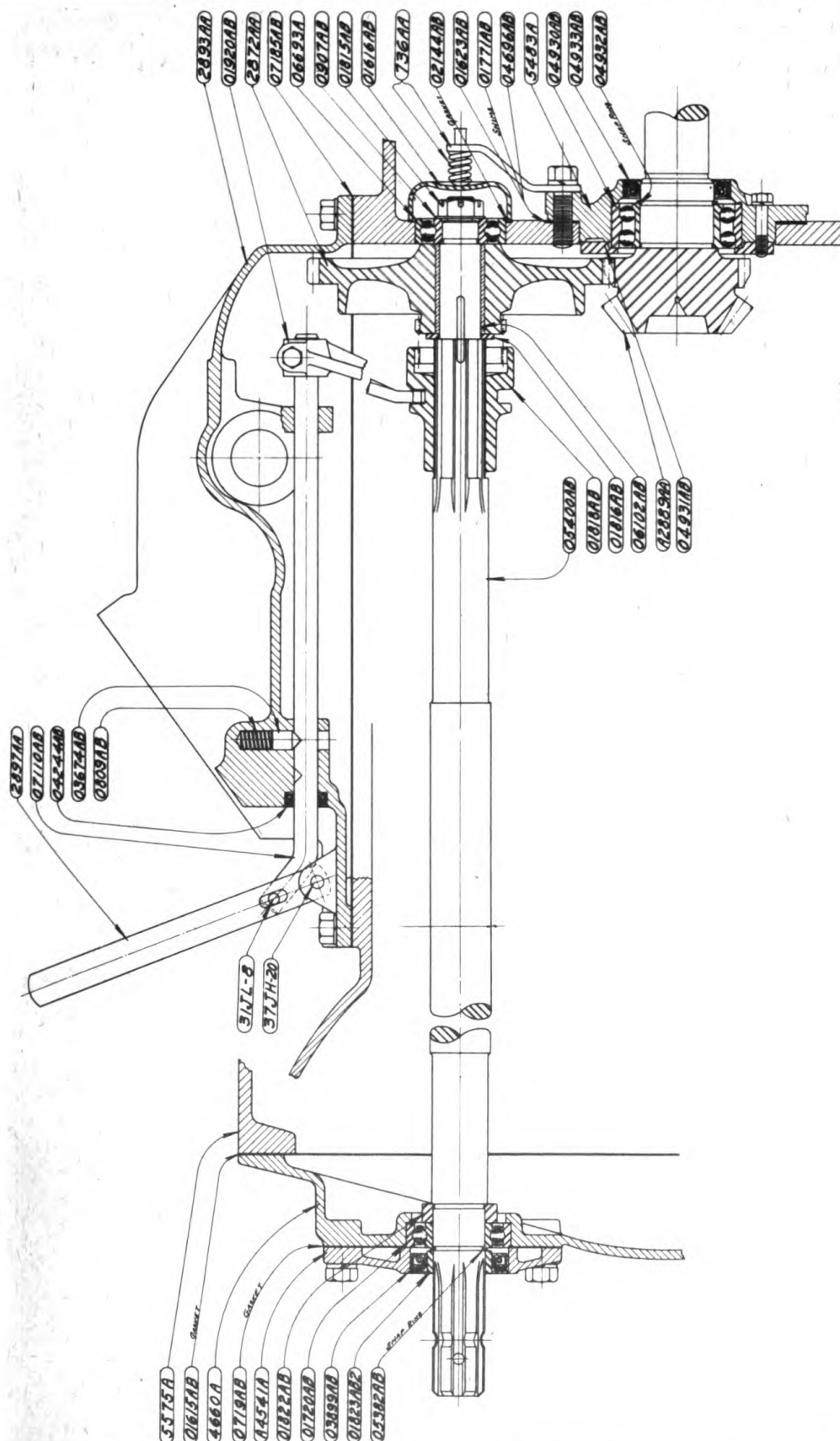


POWER TAKEOFF

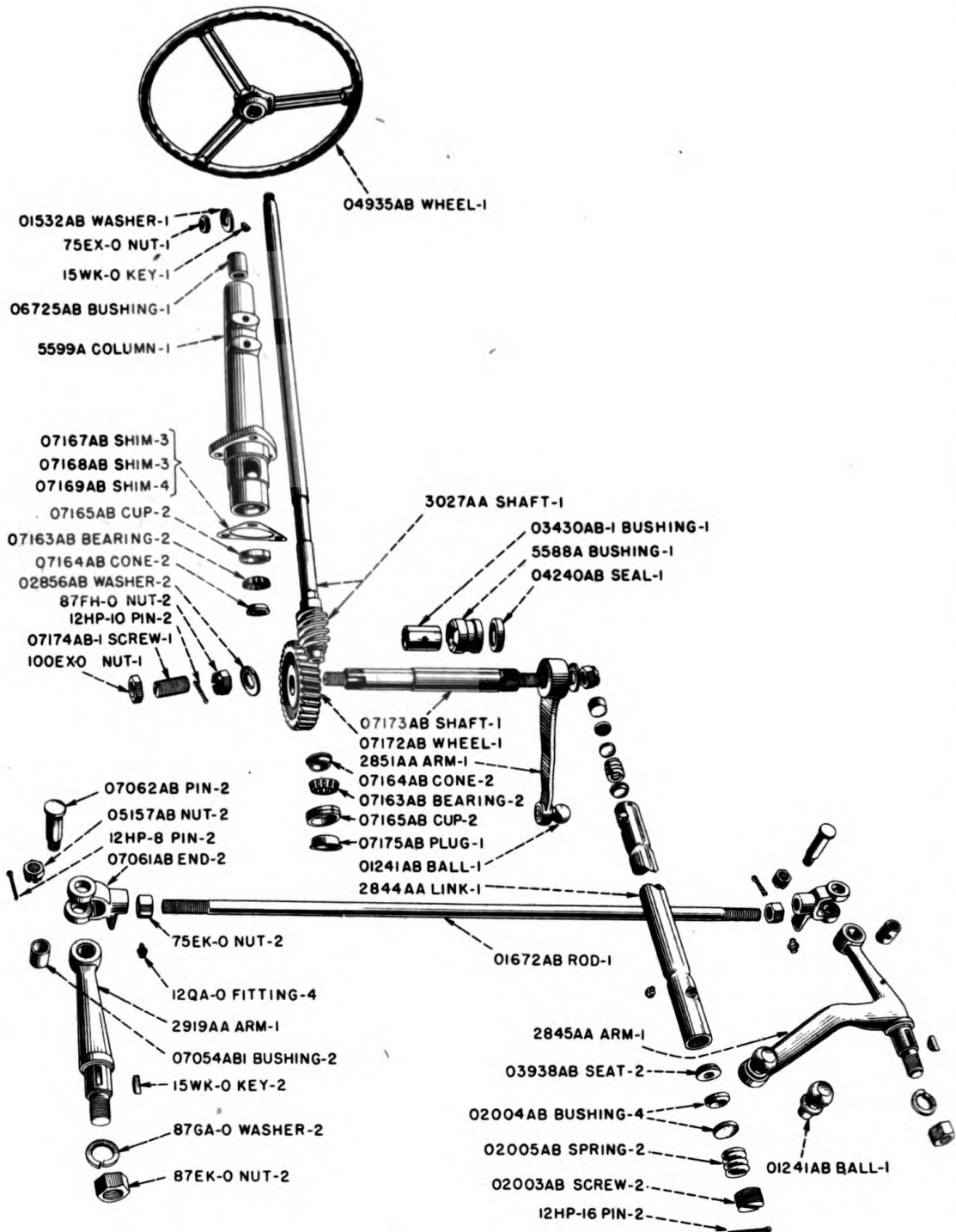
Unnumbered parts in illustrations are the same as corresponding parts shown with numbers.



POWER TAKEOFF



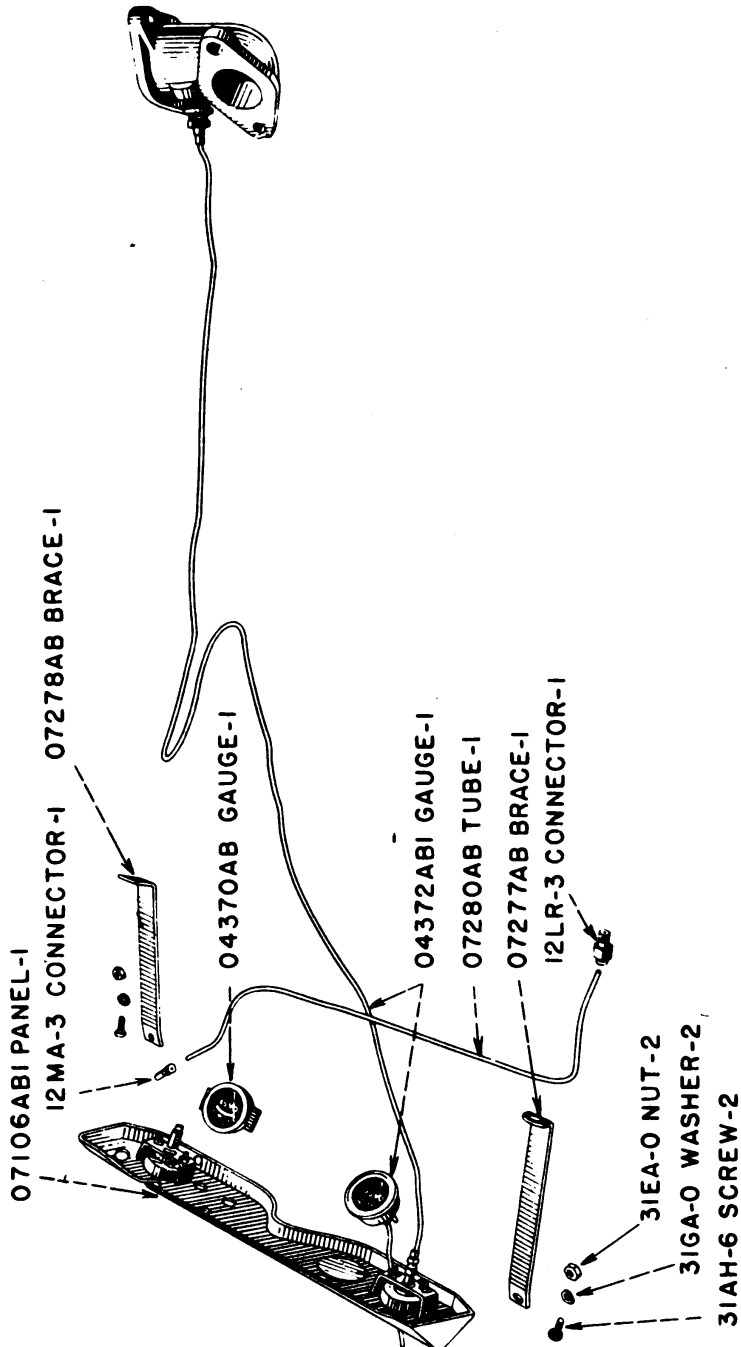
STEERING GEAR



Unnumbered parts in illustrations are the same as corresponding parts shown with numbers.

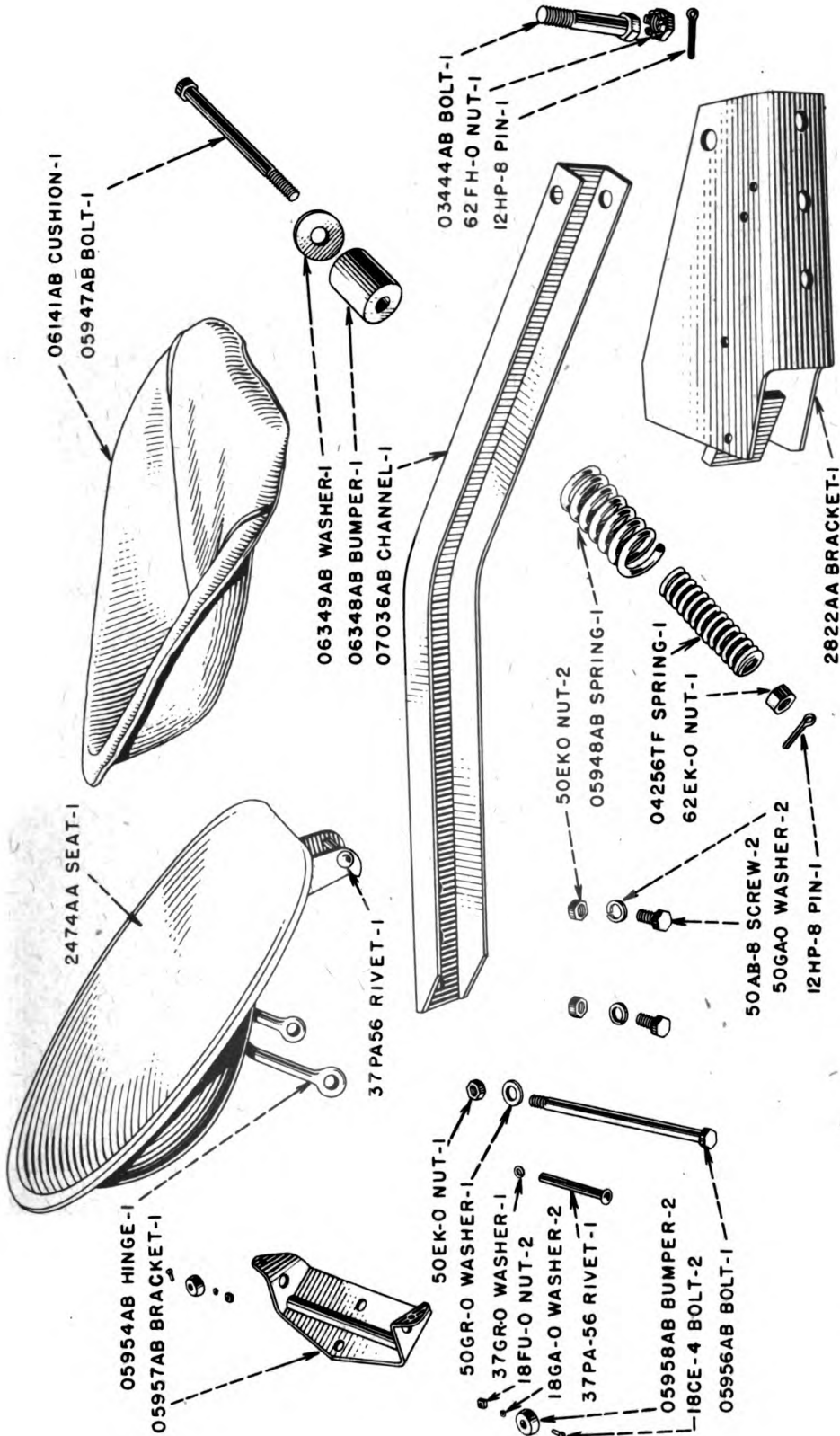
[illegible]

INSTRUMENT PANEL



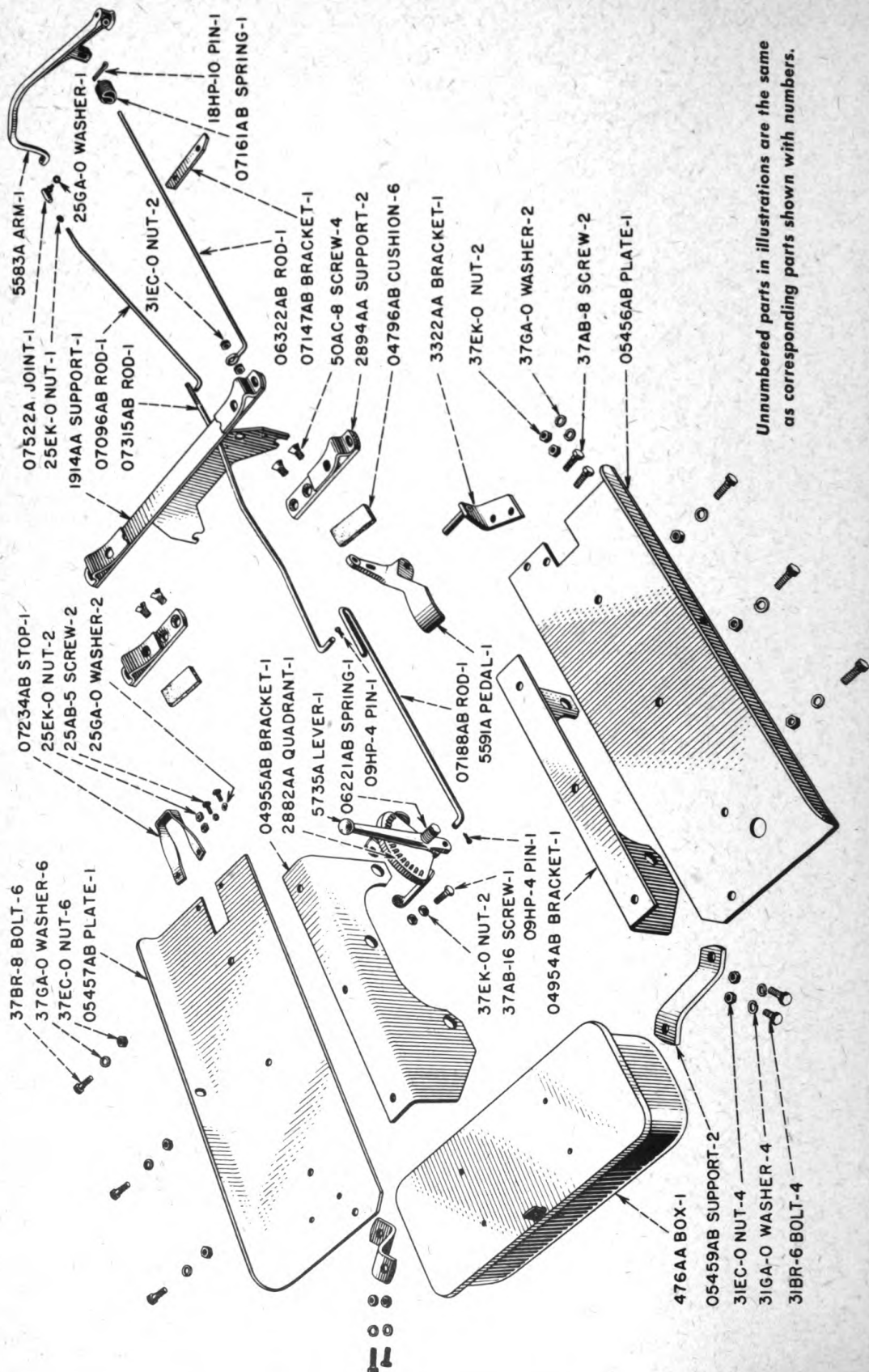
Unnumbered parts in illustrations are the same as corresponding parts shown with numbers.

SEAT — SEAT MOUNTING



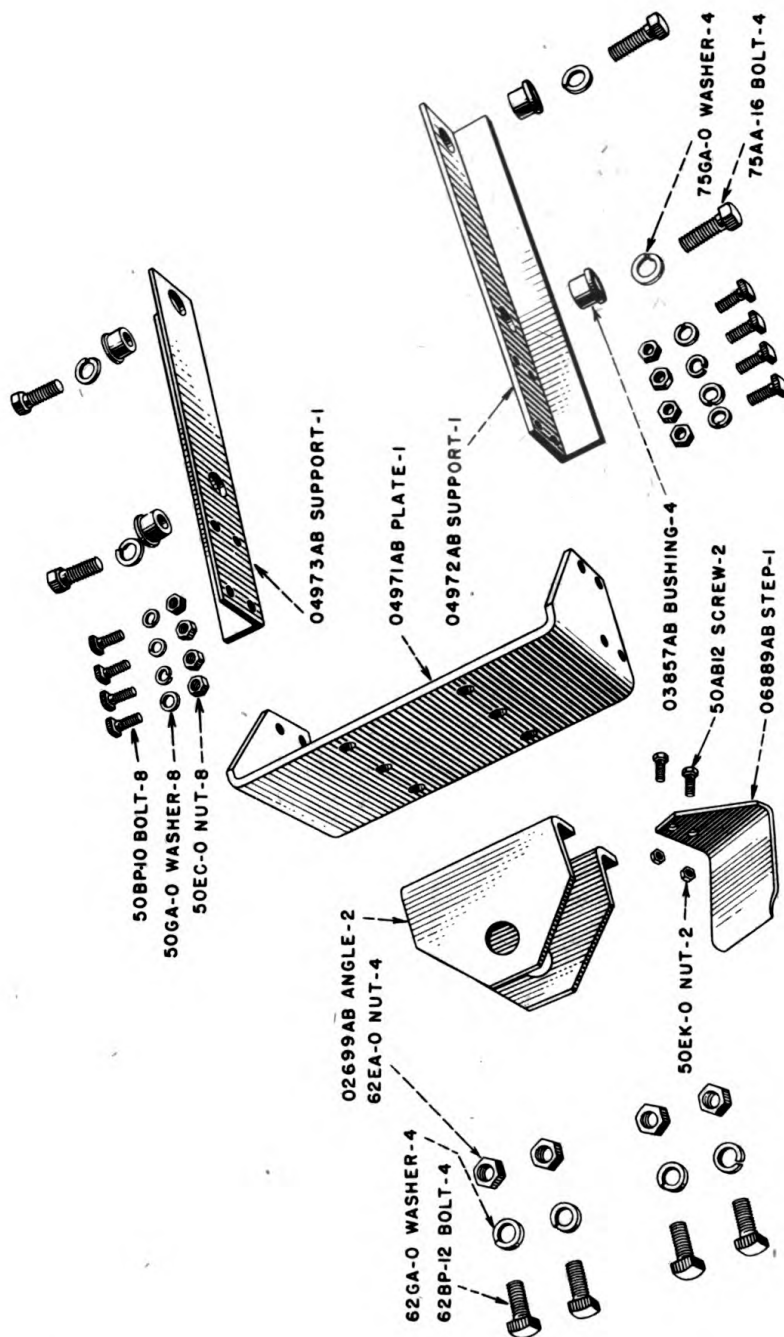
Unnumbered parts in illustrations are the same as corresponding parts shown with numbers.

PLATFORM, TOOL BOX AND THROTTLE CONTROL



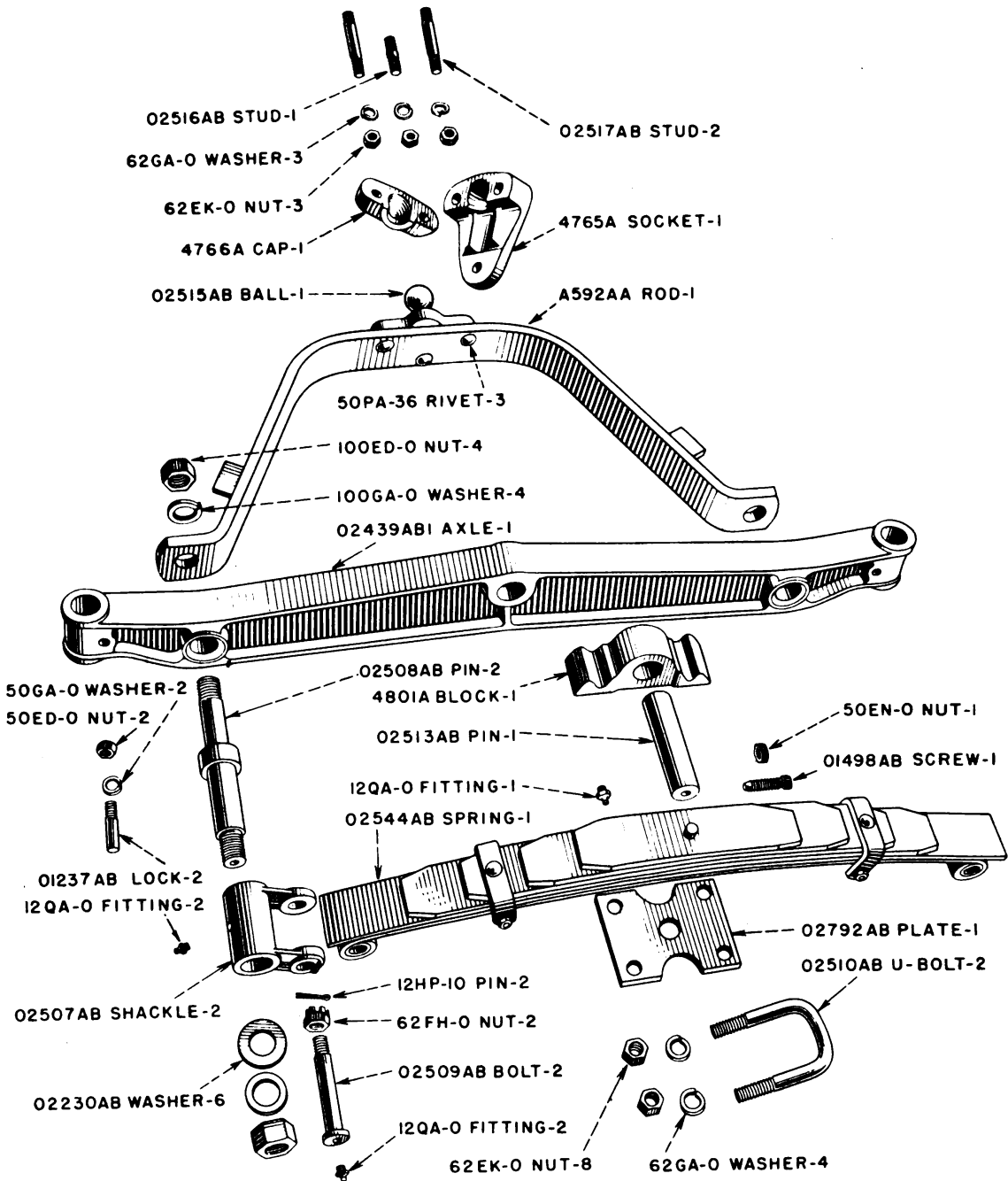
Unnumbered parts in illustrations are the same as corresponding parts shown with numbers.

DRAW BAR PARTS



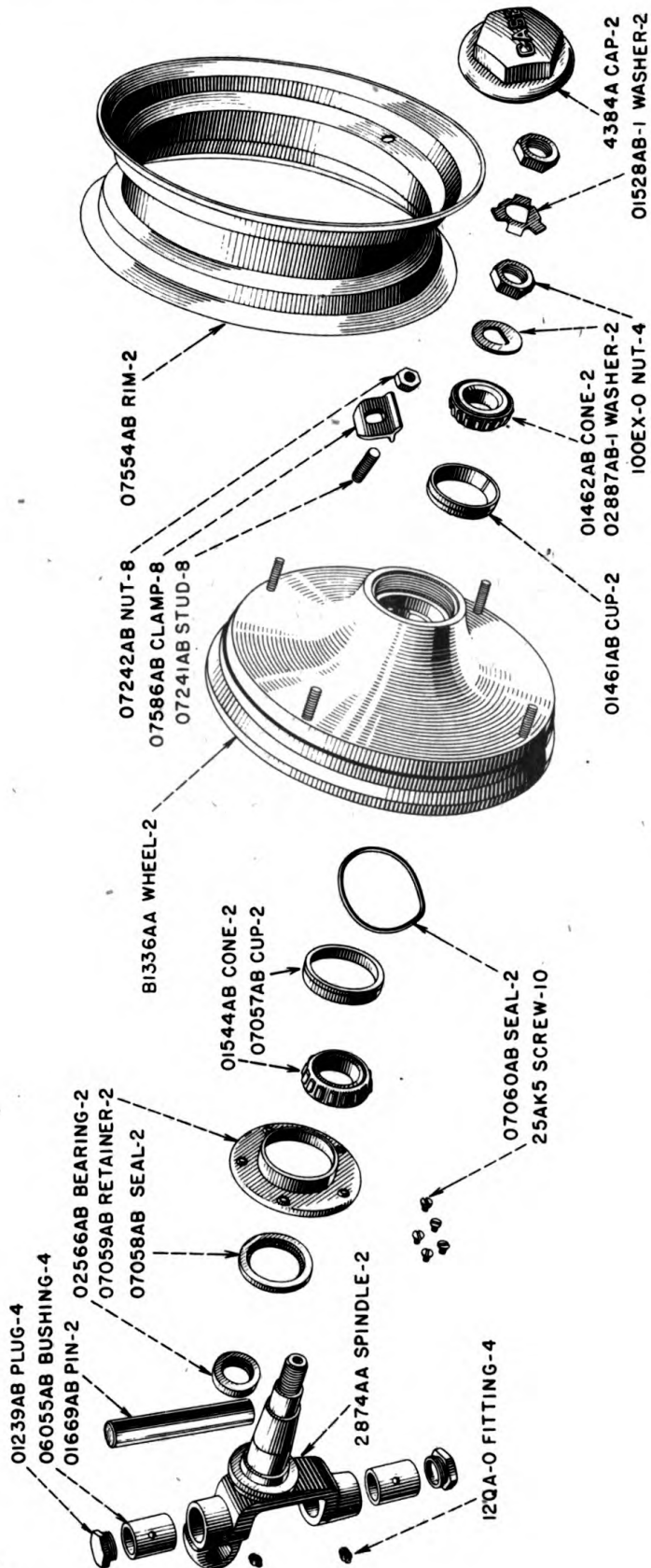
Unnumbered parts in illustrations are the same as corresponding parts shown with numbers.

FRONT AXLE



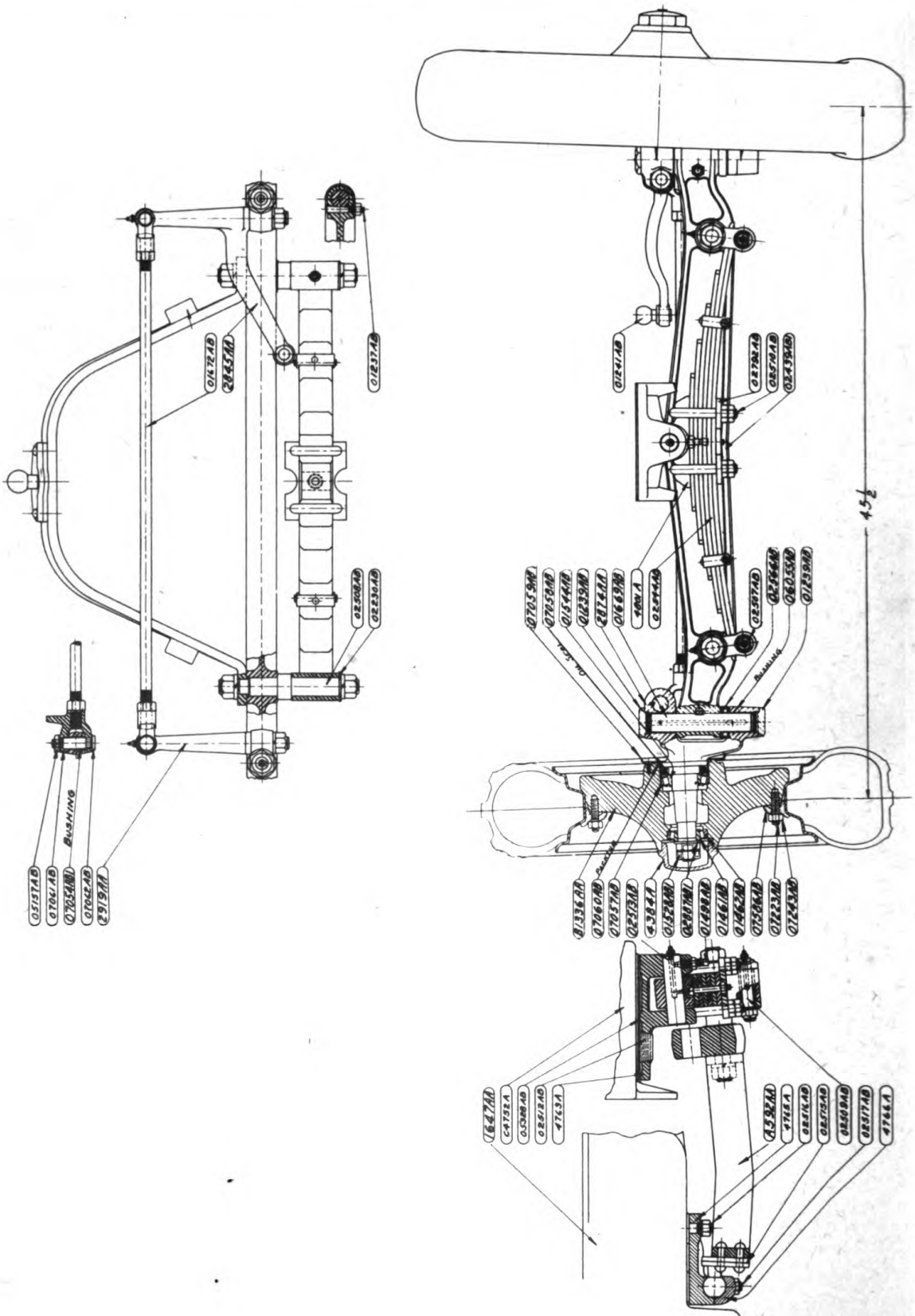
Unnumbered parts in illustrations are the same as corresponding parts shown with numbers.

FRONT WHEEL AND SPINDLE



Unnumbered parts in illustrations are the same as corresponding parts shown with numbers.

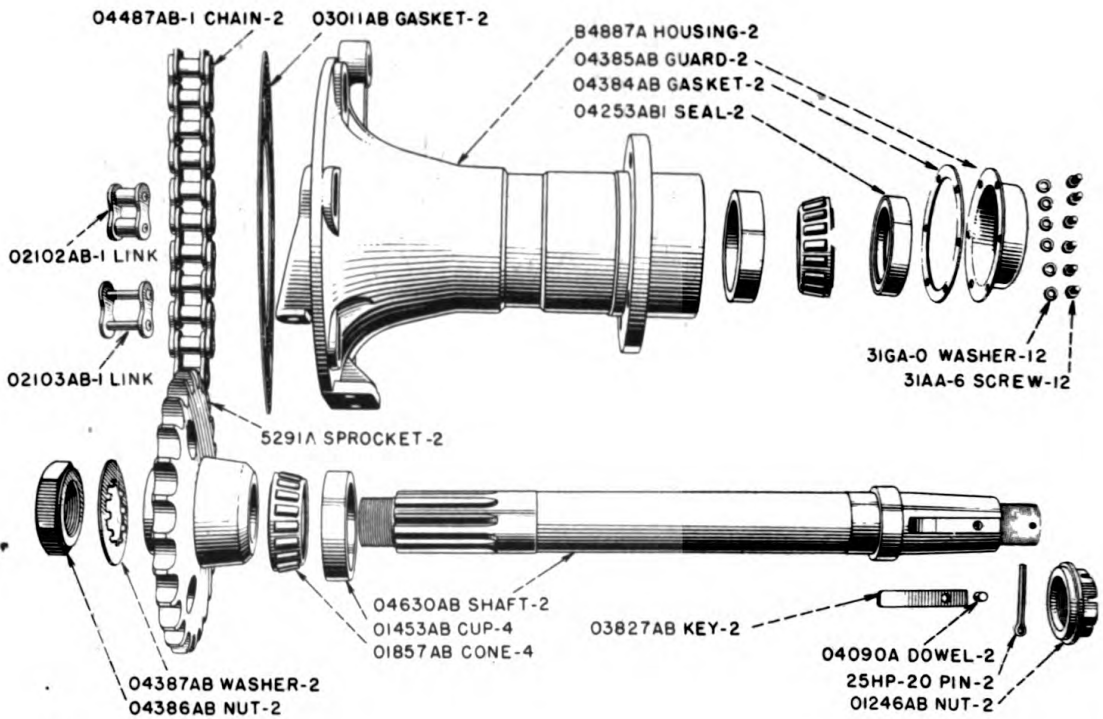
FRONT WHEEL AND AXLE ASSEMBLY



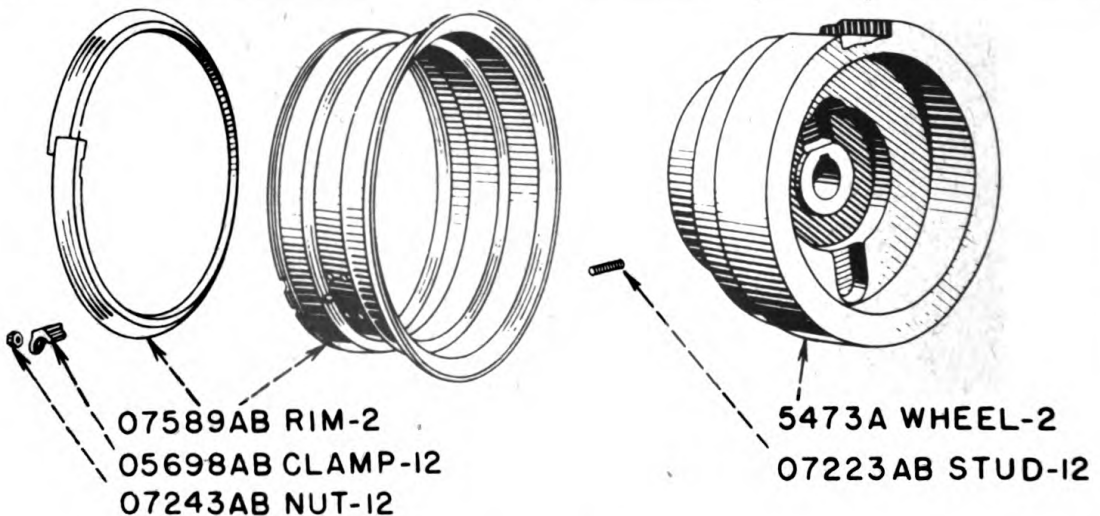
THE COMPLETE OBSERVANCE of one simple rule would prevent many thousand serious injuries each year. THAT RULE IS: "NEVER ATTEMPT TO CLEAN, OIL, OR ADJUST A MACHINE WHILE IN MOTION.

—National Safety Council.

REAR AXLE

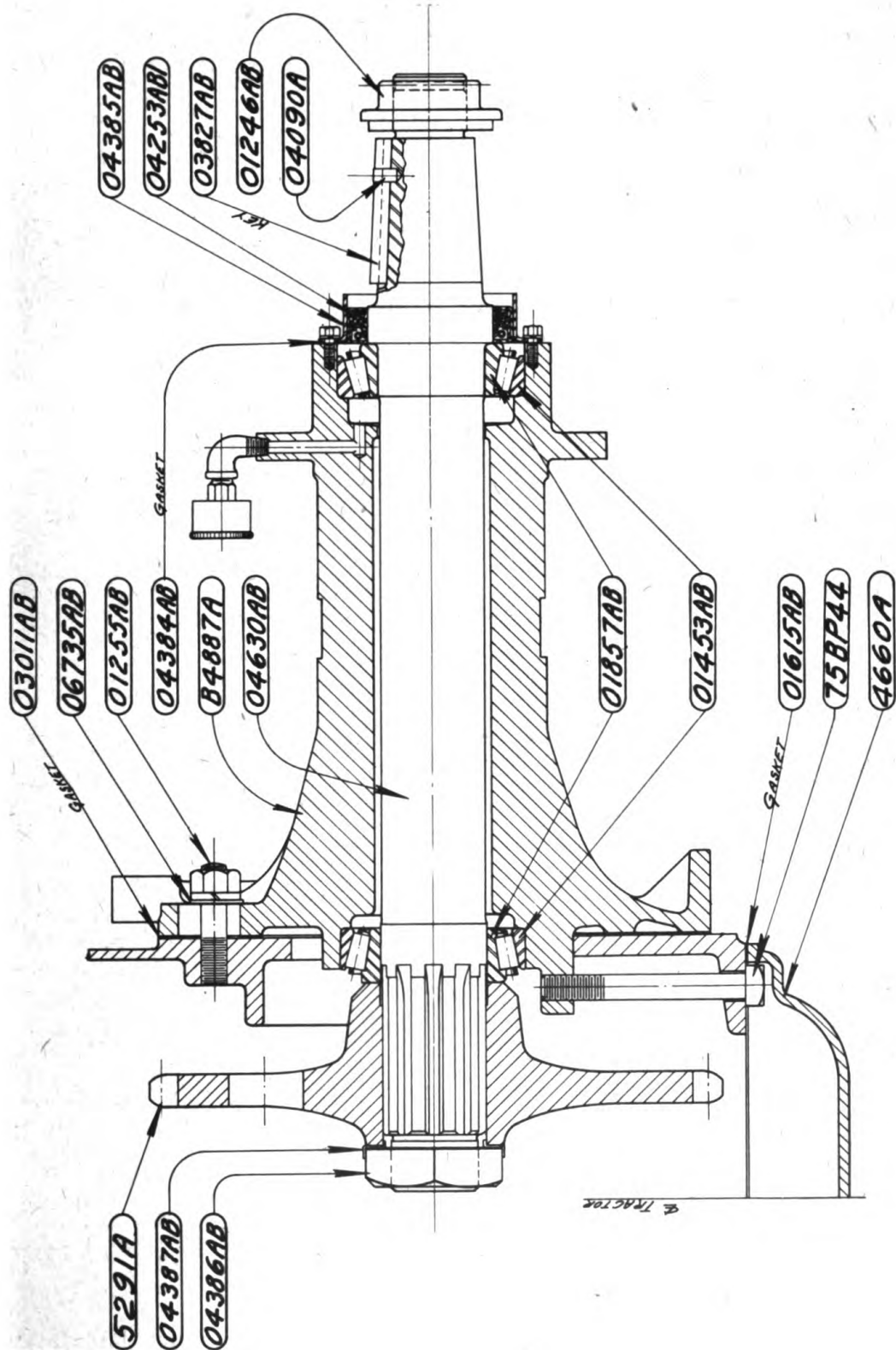


REAR WHEEL

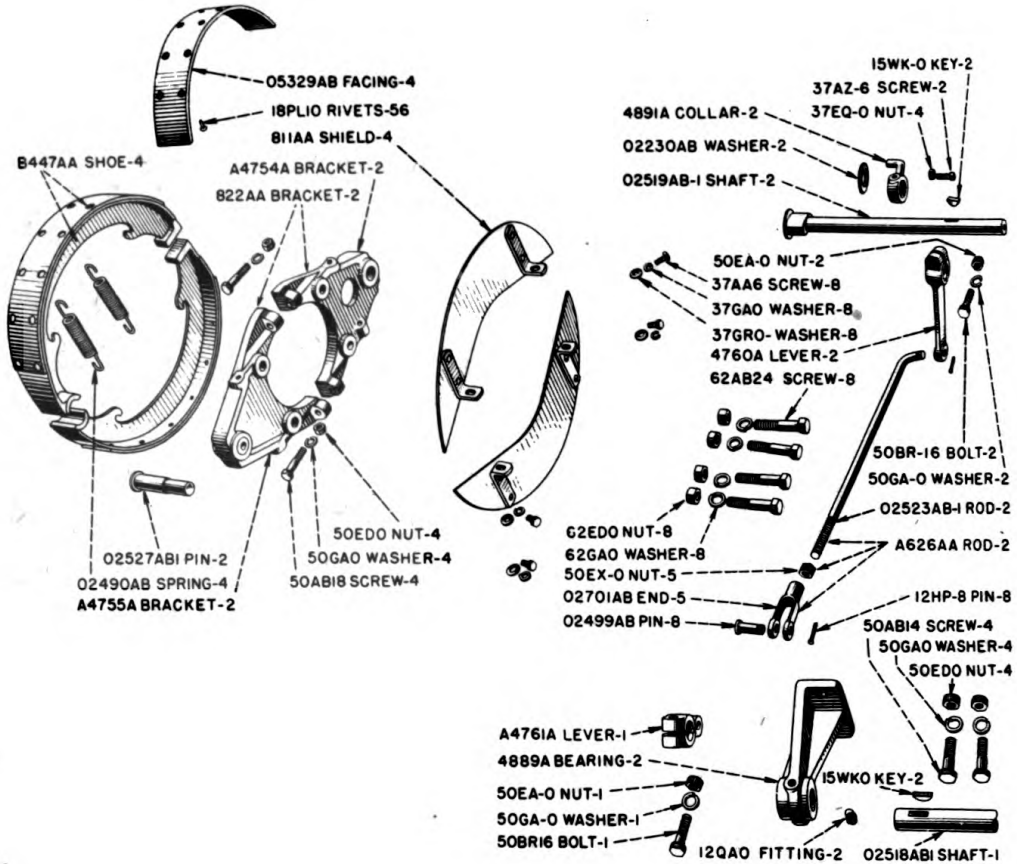


Unnumbered parts in illustrations are the same as corresponding parts shown with numbers.

REAR AXLE ASSEMBLY

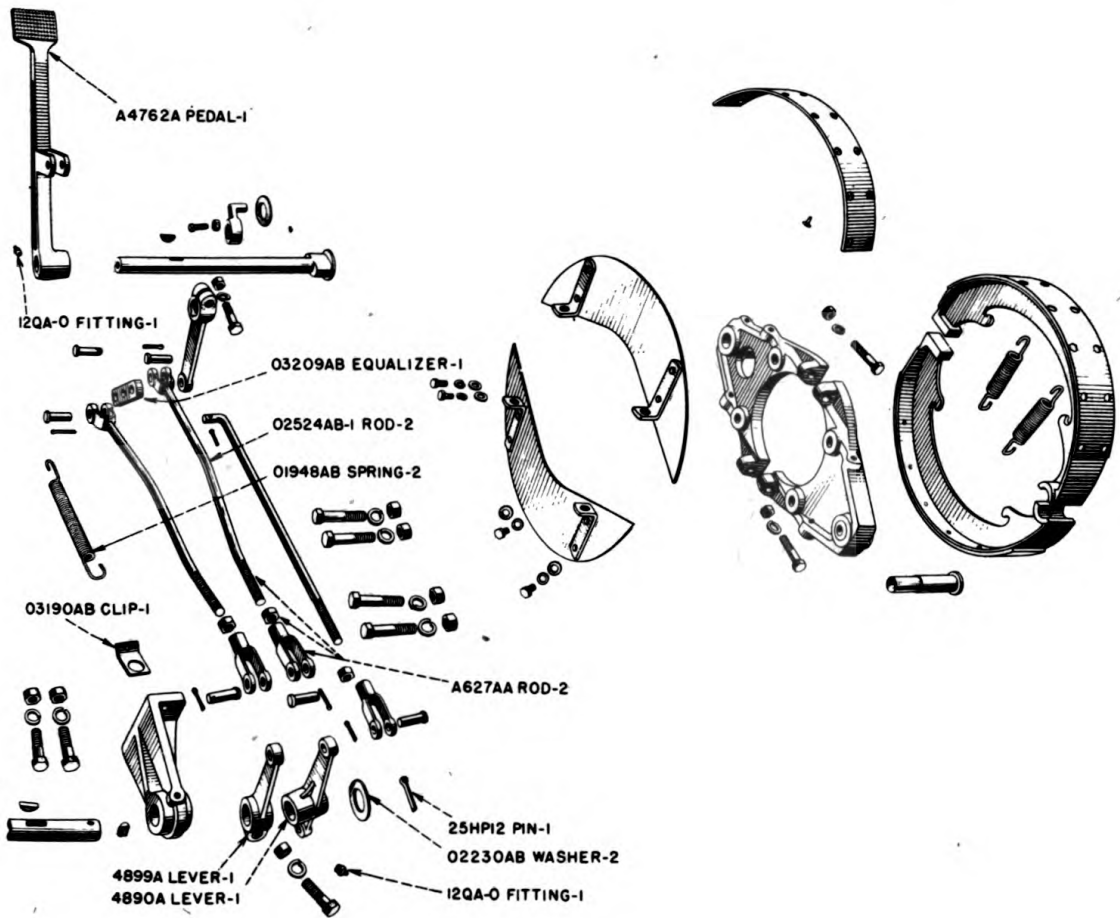


BRAKE



Unnumbered parts in illustrations are the same as corresponding parts shown with numbers.

BRAKE



Unnumbered parts in illustrations are the same as corresponding parts shown with numbers.

Technical drawing of a mechanical assembly, likely a pump or motor, showing three views: a top view, a side view, and a cross-sectional view. The drawing includes numerous dimension lines and labels for various components and dimensions.

Top View Labels:

- Q25130R2
- 489R
- Q2530R2
- Q25205R2
- Q2495R2
- Q1940R2
- Q2190R2
- Q2524R2
- 4883R
- Q270R2
- 4760R
- Q2520R2
- Q2590R2

Side View Labels:

- 5473R
- Q3329R2
- Q447R2
- 811AR
- 4899R
- Q3359R2
- 4890R
- Q250R2
- 44754A
- 44755A

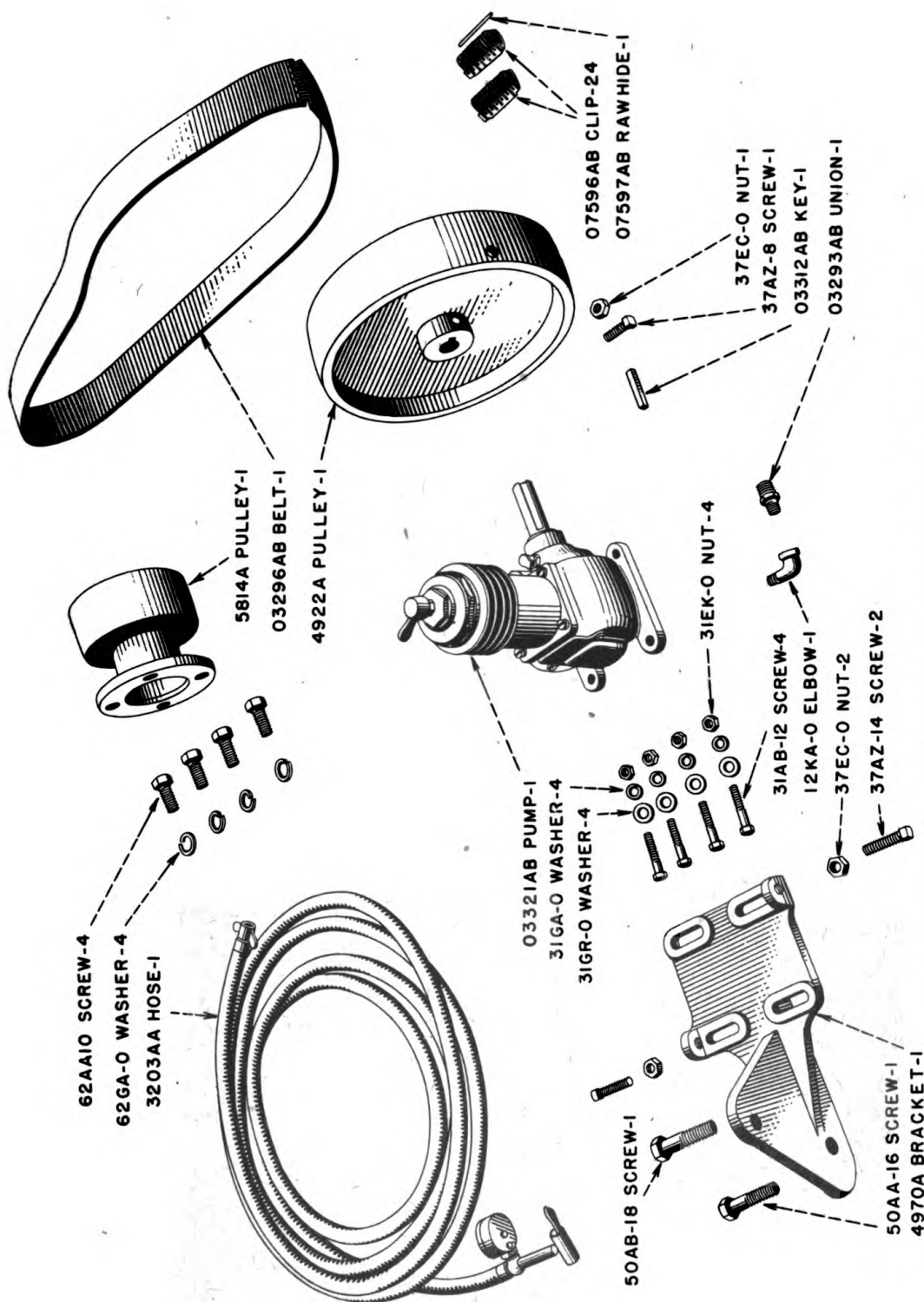
Cross-sectional View Labels:

- Q25130R2
- 489R
- Q2530R2
- Q25205R2
- Q2495R2
- Q1940R2
- Q2190R2
- Q2524R2
- 4883R
- Q270R2
- 4760R
- Q2520R2
- Q2590R2

Other Labels:

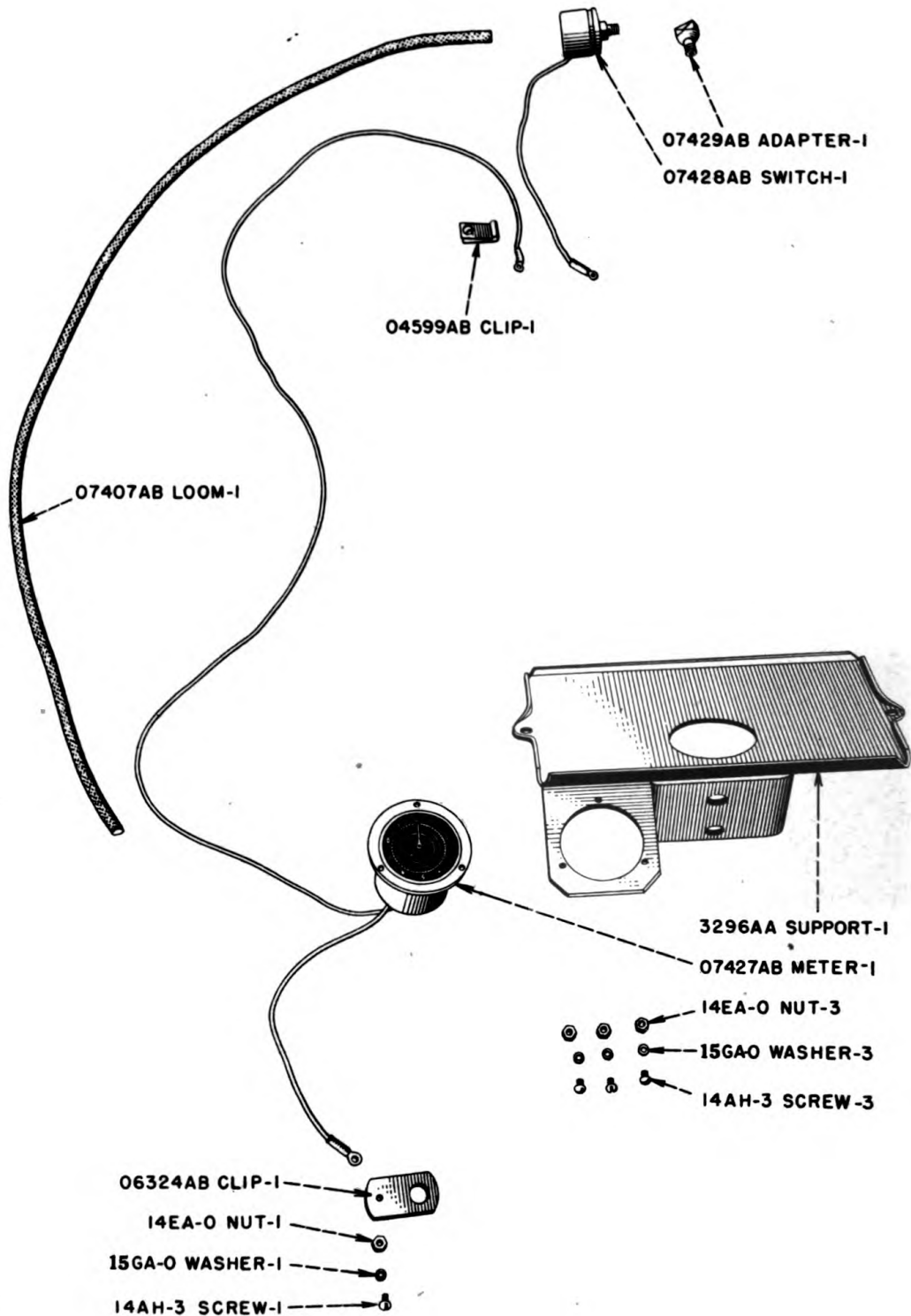
- Section A-A
- Section B-B

TIRE PUMP



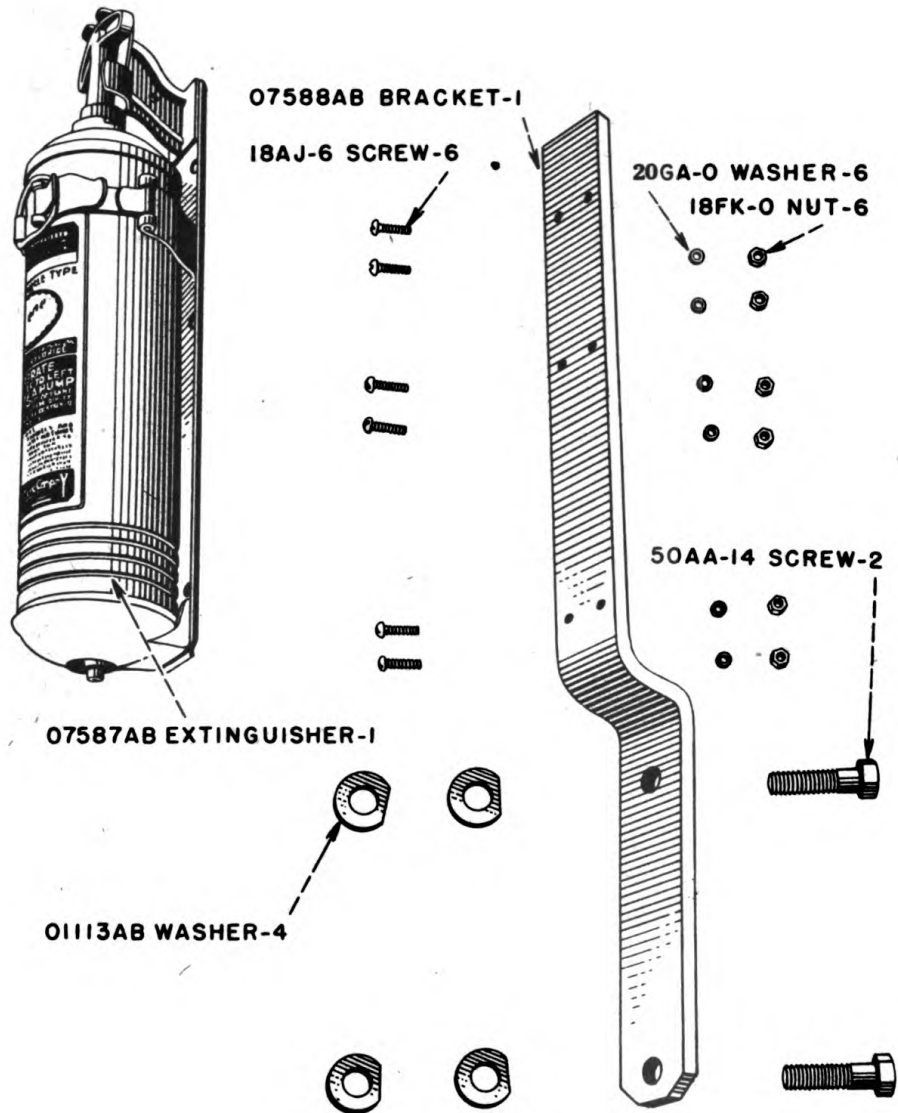
Unnumbered parts in illustrations are the same as corresponding parts shown with numbers.

ENGINE HOUR METER



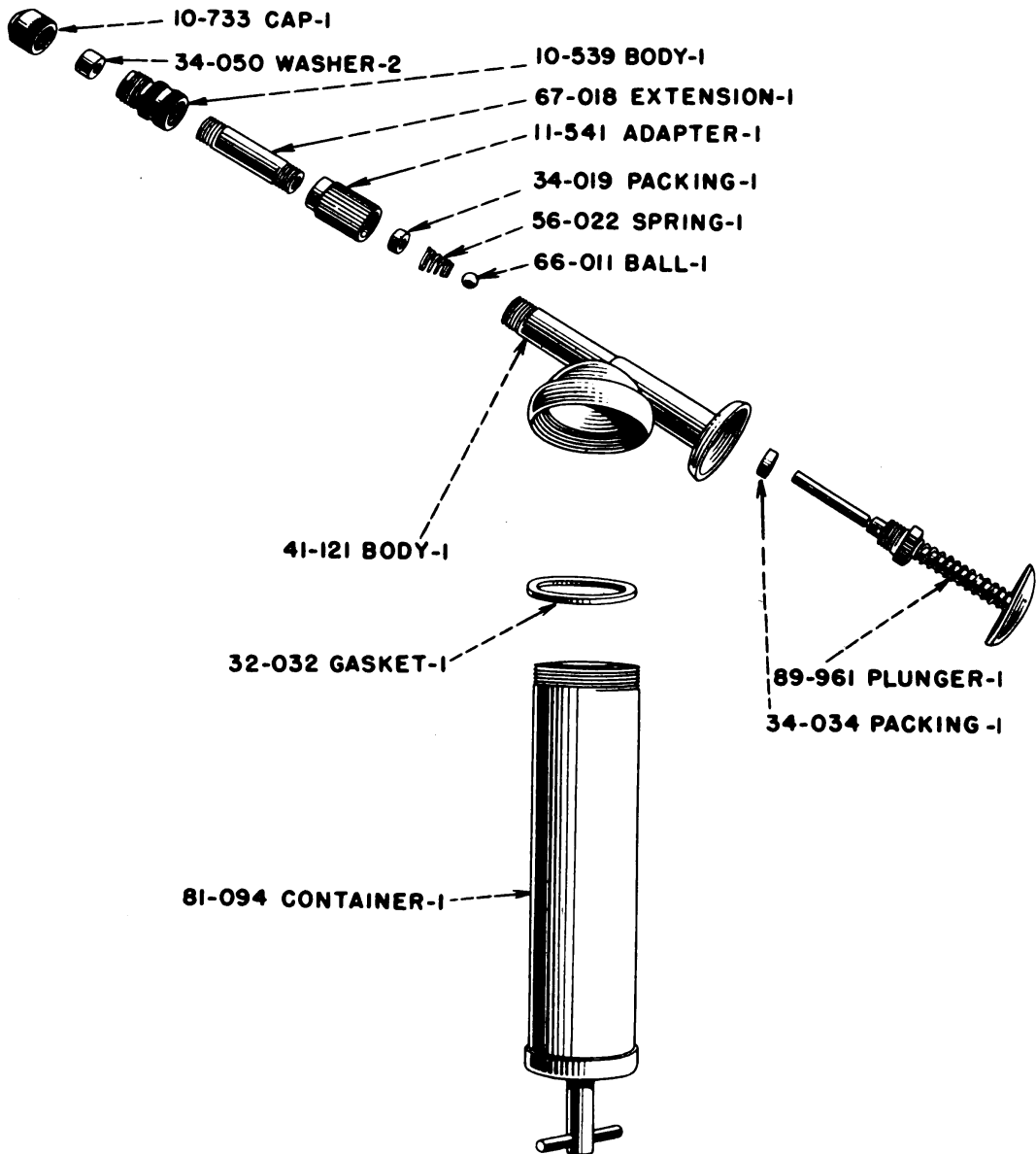
Unnumbered parts in illustrations are the same as corresponding parts shown with numbers.

FIRE EXTINGUISHER

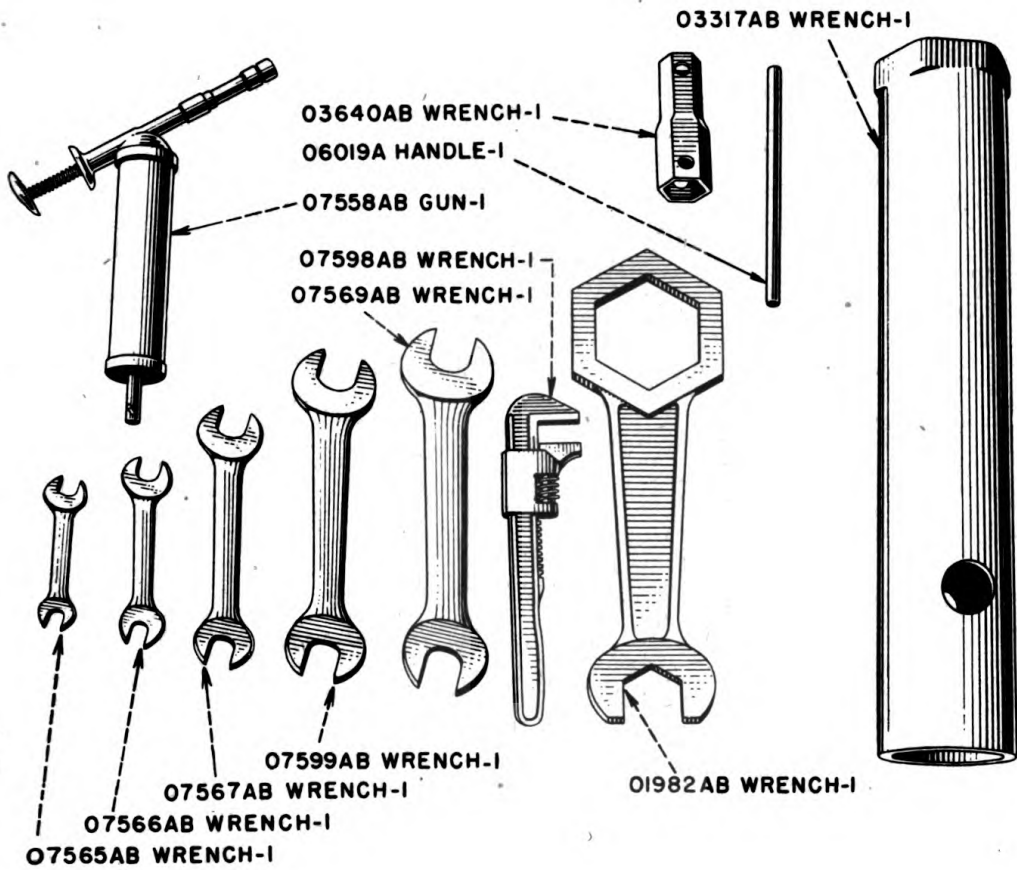


Unnumbered parts in illustrations are the same as corresponding parts shown with numbers.

GREASE GUN



TOOLS



PARTS AND PRICE LIST MODEL "DI" TRACTOR

Part No.	Description	Page No.	Qty. Used	Weight Each		Price Each
				Lbs.	Oz.	
4353 A	Bracket, valve rocker arm shaft.	8	4	..	10	.95
4355 A	Guide, inlet valve stem.	8	4	..	6	.45
4356 A	Liner, crank shaft bearing, front lower	7	1	..	10	1.45
4357 A	Liner, crank shaft bearing, front upper	7	1	..	10	1.45
4358 A	Liner, crank shaft bearing, rear lower.	7	1	..	10	1.45
4359 A	Liner, crank shaft bearing, rear upper.	7	1	..	10	1.45
4360 A	Liner, crank shaft bearing, center upper.	7	1	..	12	1.75
4361 A	Liner for crank shaft bearing, center lower.	7	1	..	12	1.75
A4362 A	Sleeve, governor	14	1	..	4	.85
4363 A	Nut, air cleaner clamp	10	1	..	3	.17
4369 A	Plug, crank case filler.	14	1	..	8	.55
A4377 A	Ring, piston, compression	7	12	..	1-1/2	.30
4384 A	Cap, hub, front.	57	2	1	10	.70
A4541 A	Cap, power take off shaft rear cover	48	1	2	3	1.95
4572 A	Barrel, cylinder	7	4	7	12	4.60
A4573 A	Piston	7	4	3	3	3.45
A4574 A	Cap, crank shaft bearing, center.	7	1	3	8	1.25
A4575 A	Cap, crank shaft bearing, front or rear	7	2	3	8	1.25
4576 A	Lifter, push rod	8	8	..	5	.65
A4587 A	Body, oil pump	16	1	5	7	6.35
4592 A	Bearing, starting crank.	24	1	4	7	1.65
A4594 A	Tank, radiator, lower.	22	1	8	8	3.60
4598 A	Elbow, radiator, outlet.	22	1	1	8	.60
B4608 A	Carrier, first reduction shaft bearing, R.H.	38	1	2	14	1.65
4609 A	Carrier, first reduction shaft bearing, L.H. and sliding gear shaft bearing.	38, 40	2	3	3	1.65
4611 A	Pulley, brake.	40	1	4	9	2.20
4644 A	Bearing, governor shaft.	14	1	..	7	1.00
A4648 A	Ring, piston, oil.	7	4	..	2	.40
4660 A	Cover, transmission case, rear	48	1	25	12	7.70
4717 A	Yoke, clutch throwout.	33	1	1	14	1.95
C4752 A	Bracket, front axle and radiator	24	1	144	..	30.80
A4754 A	Bracket, rear wheel brake, front	62	2	10	4	3.30
A4755 A	Bracket, rear wheel brake, rear.	62	2	11	2	3.30
4760 A	Lever, brake cam shaft	62	2	1	2	1.10
A4761 A	Lever, brake cross shaft, short	62	1	..	12	1.10
A4762 A	Pedal, foot brake.	63	1	5	12	2.75
4763 A	Pedestal, spring mounting.	24	1	16	..	10.75
4765 A	Socket, radius rod ball.	56	1	6	4	1.40
4766 A	Cap, radius rod ball socket	56	1	2	2	.55

PARTS AND PRICE LIST MODEL "DI" TRACTOR (Continued)

Part No.	Description	Page No.	Qty. Used	Weight Each		Price Each
				Lbs.	Oz.	
A4767 A	Cover, oil pump.	16	1	1	14	1.95
A4787 A	Pedal, foot clutch	33	1	4	..	2.50
4788 A	Lever, foot clutch	33	1	1	..	1.65
A4792 A	Plate, clutch pressure; purchased from Rockford Drilling Machine Co., Rockford, Ill. Their No. CL-3707.	32	1	14	7	8.60
4801 A	Block, spring pivot. . . .	56	1	4	..	4.40
B4887 A	Housing, rear axle	60	2	148	..	38.50
4889 A	Bearing, wheel brake cross shaft.	62	2	4	10	2.50
4890 A	Lever, double, brake cross shaft.	63	1	1	2	1.95
4891 A	Collar, brake cam shaft. .	62	2	..	6	.50
4899 A	Lever, brake cross shaft, long.	63	1	..	15	1.65
4909 A	Collar, adjusting, clutch brake.	33	1	..	12	1.65
4922 A	Pulley, tire pump.	65	1	14	..	8.80
4970 A	Bracket, tire pump	65	1	6	14	2.75
4975 A	Manifold, inlet.	10	1	9	..	4.50
4976 A	Lifter, push rod - .010" oversize	8	8	..	6	.65
5148 A	Elbow, exhaust, muffler. .	10	1	3	4	2.20
5239 A	Flywheel	7	1	60	8	27.50
5288 A	Bushing, governor shaft. .	14	2	..	1	.30
5289 A	Tee, valve rocker arm, oil supply	8	1	..	8	.55
5291 A	Sprocket, (25 tooth) rear axle.	60	2	37	..	9.90
5360 A	Manifold, exhaust.	10	1	15	13	6.35
A5362 A	Member, radiator side, R.H.	22	1	17	..	5.25
A5363 A	Member, radiator side, L.H.	22	1	17	..	5.25
5365 A	Cap radiator	22	1	2	10	.65
5380 A	Shifter, first and third gear	46	1	2	3	1.75
5381 A	Shifter, second and re- verse gear	46	1	2	1	1.75
5382 A	Shifter, fourth gear	46	1	2	8	2.75
5384 A	Socket, ball, gear shift lever.	46	1	1	5	1.40
A5414 A	Elbow, radiator inlet. . . .	22	1	3	6	1.10
5473 A	Wheel, rear.	60	2	655	..	95.00
5483 A	Carrier, clutch shaft bearing.	34	1	6	7	3.30
5484 A	Sleeve, clutch release . .	33, 34	1	1	7	2.20
5496 A	Tank, radiator top	22	1	42	1	9.35
5502 A	Body, air cleaner.	10	1	16	11	5.25
5503 A	Reservoir, air cleaner . . .	10	1	8	3	2.20
5504 A	Adapter, carburetor. . . .	10	1	2	12	1.40
A5549 A	Guide, exhaust valve	8	4	..	6	.40
5563 A	Carrier, differential shaft bearing.	44	2	11	5	2.75
5568 A	Drum, clutch brake	33, 38	1	8	2	4.95
5570 A	Trap, oil, air cleaner	10	1	9	8	1.95
5571 A	Elbow, cylinder inlet. . . .	22	1	2	3	.70
5575 A	Transmission case.	37	1	366	..	75.90
5578 A	Impeller, water pump; purchased from Schwitzer-Cummins Co., Indianapolis, Ind. Their No. B111811. . . .	20	1	..	13	1.10

PARTS AND PRICE LIST MODEL "DI" TRACTOR (Continued)

Part No.	Description	Page No.	Qty. Used	Weight Each		Price Each
				Lbs.	Oz.	
5583 A	Arm, governor.	14, 54	1	1	6	1.40
5588 A	Bushing, transmission case top cover, outer.	50	1	..	14	1.10
5591 A	Pedal, foot accelerator.	54	1	1	5	.55
5592 A	Bracket, head lamp	26	2	..	6	.30
5599 A	Column, steering post.	50	1	9	12	6.35
5733 A	Handle, radiator shutter control.	23	1	..	1/2	.17
5735 A	Lever, hand throttle	54	1	..	6	.30
5814 A	Pulley, tire pump drive.	65	1	7	..	3.50
5823 A	Gear, governor	14	1	2	..	2.50
5824 A	Gear, cam shaft.	8	1	5	..	3.60
04090 A	Dowel, rear axle key	60	2	..	1/3	.06
04547 A	Retainer, valve spring	8	8	..	2/3	.11
05490 A	Nut, 5/16" flared tube nut for 07284 AB tube.	25	2	..	1	.11
05939 A	Clip, generator wire	26	1	..	1/12	.06
06019 A	Handle, spark plug wrench	69	1	1	4	.11
06680 A	Cup, first reduction shaft bearing, R.H. and L.H., Timken No. 432.	38	2	..	13	2.30
06693 A	Bearing, power take off shaft, front end. New Departure No. 1305	48	1	..	8	3.10
07285 A	Bearing, pilot, clutch shaft. New Departure No. 1205	7	1	..	5	2.30
07522 A	Ball joint, governor lever to carburetor.	14, 54	1	..	1	.30
010909 A	Cap, fuel tank	25	1	..	3	.30
79 AA	Band with lining, hand brake.	42	1	1	4	1.10
93 AA	Screen, oil pump	16	1	1	12	2.20
142 AA	Crank, starting, complete with bearing and spring	24	1	9	..	4.15
153 AA	Rod, connecting, complete with bolts, nuts and shims.	7	4	3	10	10.45
A154 AA	Block, cylinder, with barrels, packing, bearing caps, liners, shims and screws	6	1	245	..	94.60
155 AA	Arm, valve rocker, with bushing, R.H.	8	4	..	6	1.40
156 AA	Arm, valve rocker, with bushing, L.H.	8	4	..	6	1.40
165 AA	Crank, starting.	24	1	8	15	2.30
197 AA	Puller, cylinder barrel.	7	1	7	5	4.95
B208 AA	Cover, cylinder head, with breather elbow.	6	1	15	14	5.80
B447 AA	Shoe, brake, with facing	62	4	9	14	12.10
476 AA	Box, tool.	54	1	4	..	2.20
A592 AA	Rod, radius, with ball	56	1	24	..	8.25
B618 AA	Plate, clutch back; purchased from Rockford Drilling Machine Co., Rockford, Ill. Their No. UCL-3856-1	32	1	11	..	12.65

PARTS AND PRICE LIST MODEL "DI" TRACTOR (Continued)

Part No.	Description	Page No.	Qty. Used	Weight Each		Price Each
				Lbs.	Oz.	
A620 AA	Plate, clutch drive, assembly with facings; purchased from Rockford Drilling Machine Co., Rockford, Ill. Their No. UCL-3860	32	1	5	2	13.75
	NOTE:—When facings become worn the drive plate assembly may be returned to Racine to be exchanged for one which has been relined at a special exchange price.					
A623 AA	Shield, tubular, for end of power take off shaft.	48	1	..	9	.55
A626 AA	Rod, brake, with end, cross shaft to cam shaft.	62	2	3	8	.85
A627 AA	Rod, brake, with end, equalizer to cross shaft.	63	2	1	7	1.55
A637 AA	Pump, oil, assembly.	16	1	10	4	13.75
736 AA	Support with spring for P.T.O. front cover	48	1	..	4	.22
754 AA	Handle with spring for hand brake lever	42	1	..	3	.45
A789 AA	Block, cylinder, with bearing caps, liners, shims and screws, less cylinder barrels	6	1	220	..	88.00
811 AA	Shield complete, brake drum	62	4	1	14	1.10
A820 AA	Barrels, pistons, rings, piston pins and packing, fitted, for cylinder (set of 4)	7	1	43	..	28.60
822 AA	Bracket, rear wheel brake, front and rear.	62	2	21	6	8.00
B865 AA	Flywheel with ring gear.	7	1	64	..	30.00
A1172 AA	Carrier for sliding gear shaft bearing, R.H. with brake lever pin and ratchet.	40	1	5	..	3.30
B1336 AA	Wheel, front, with bearing cups and studs	57	2	90	..	20.00
A1496 AA	Elbow, breather, with screens for cylinder head cover	6	1	1	2	.85
A1641 AA	Lever, clutch release, assembly; purchased from Rockford Drilling Machine Co., Rockford, Ill. Their No. UCL-3695-1	32	3	..	6	1.95
1647 AA	Pan, oil	6	1	87	..	20.35
1734 AA	Camshaft with plunger pin, and spring.	8	1	12	..	18.50
1766 AA	Cover, battery	26	1	3	7	2.50
1885 AA	Bracket, hood clamp, rear	22	4	..	4	.30
1914 AA	Support, front, for fuel tank	54	1	4	11	1.65
A1915 AA	Hood complete.	22	1	19	..	6.50

PARTS AND PRICE LIST MODEL "DI" TRACTOR (Continued)

Part No.	Description	Page No.	Qty. Used	Weight Each		Price Each
				Lbs.	Oz.	
2172 AA	Guard, power take off. . .	48	1	5	8	1.95
2173 AA	Clutch complete. Model 12"-TT; purchased from Rockford Drilling Machine Co., Rockford, Ill. Their No. CLA-988-3.	32	1	32	..	28.60
A2234 AA	Radiator complete. . . .	22	1	114	..	50.00
A2265 AA	Tank, fuel	25	1	24	9	11.00
2280 AA	Rings, piston, set of 16	7	1	2	8	5.20
2312 AA	Box and screen, air cleaner.	10	1	..	9	1.10
2313 AA	Screen, chaff, air cleaner.	10	1	..	2	.55
2474 AA	Seat, operators.	53	1	11	12	5.25
2761 AA	Impeller assembly, water pump; purchased from Schwitzer-Cummins Co., Indianapolis, Ind. . . .	20	1	1	2	1.95
2822 AA	Bracket, channel, and tie strap for seat . .	53	1	10	..	1.95
2829 AA	Gear, differential ring, assembly	44	1	53	..	35.00
2844 AA	Link, steering drag. . .	50	1	9	2	5.05
2845 AA	Arm, steering spindle, with ball and bushing, left hand.	50	1	4	14	4.70
2846 AA	Bracket and strap, generator	26	1	1	..	.55
2851 AA	Arm, steering drop, with ball	50	1	4	4	3.30
2872 AA	Gear with bushing, power take off	48	1	11	..	8.25
2873 AA	Head, cylinder, with valve guides and valve inserts.	6	1	73	..	30.25
2874 AA	Spindle, steering, with bushings, nuts and washer	57	2	11	..	9.90
2882 AA	Quadrant, throttle control	54	1	..	6	.65
2883 AA	Body with bushing, water pump	20	1	6	7	3.85
A2889 AA	Shaft and bevel pinion, clutch, with transmission bevel gear. . . .	34, 38	1	22	..	36.30
NOTE*-When clutch shaft and bevel pinion or transmission bevel gear are ordered for repairs, we furnish clutch shaft and bevel pinion with matched bevel gear which is included in A2889 AA*.						
2893 AA	Cover, transmission case, top, with bushings and oil seal	46	1	54	..	15.00
2894 AA	Support, rear, fuel tank	54	2	1	8	.65
2897 AA	Lever, power take off shifter.	46	1	..	8	.50
2898 AA	Head, cylinder, with guides, valves and valve springs.	6	1	79	..	46.00

PARTS AND PRICE LIST MODEL "DI" TRACTOR (Continued)

Part No.	Description	Page No.	Qty. Used	Weight Each		Price Each
				Lbs.	Oz.	
2919 AA	Arm, steering spindle, with bushing, right hand	50	1	2	6	3.30
2971 AA	Shoe with lining, clutch brake.	33	1	3	..	1.10
3009 AA	Bracket with bushings, magneto.	14	1	9	13	6.25
3014 AA	Pulley, fan drive, with set screw.	7, 20	1	10	6	4.50
3027 AA	Shaft and worm, steering wheel.	50	1	8	..	7.00
3029 AA	Governor assembly.	14	1	14	10	20.35
3049 AA	Pipe, air intake	10	1	..	15	1.50
3189 AA	Clamp, oil filter.	18, 19	2	..	14	.60
3203 AA	Hose assembly for tire pump; purchased from Kellogg Mfg. Co., Rochester, N. Y. Their No. 12H2516.	65	1	3	4	6.70
3206 AA	Liners and shims, set of main bearings.	7	1	4	4	18.20
3221 AA	Step, mounting	55	1	3	8	.75
3222 AA	Gaskets, complete set of engine	6	1	1	8	5.00
3252 AA	Rod, connecting, complete with bolts, nuts and shims. .010" undersize.	7	4	3	10	10.45
3253 AA	Rod, connecting, complete with bolts, nuts and shims. .020" undersize.	7	4	3	10	10.45
3278 AA	Cover, timing gear	6	1	12	12	4.75
3288 AA	Shaft, crank	7	1	54	12	50.60
3291 AA	Lever, hand brake.	42	1	3	3	1.50
3296 AA	Support, battery, with front lamp bracket and hour meter mounting plate.	26	1	8	6	4.00
3322 AA	Bracket with stud for foot accelerator pedal	54	1	20	14	.50
0687 AB	Gasket, radiator header.	22	2	..	1	.30
0700 AB	Gasket, oil pan hand hold cover	6	4	..	1/2	.17
0719 AB	Gasket, power take off shaft rear cover cap	48	1	..	1/4	.20
0765 AB	Pin, piston.	7	4	..	9	.90
0766 AB	Screw, piston pin clamp.	7	4	..	1	.11
0767 AB	Washer, lip, piston pin clamp screw.	7	4	..	1	.03
0769 AB	Nut, connecting rod bolt	7	8	..	1	.11
0770 AB	Shim, connecting rod, .003" thick.	7	24	..	1/25	.02
0774 AB	Washer, valve rocker arm shaft.	8	2	..	1/2	.06
0778 AB	Stud, valve rocker arm bracket, short	8	2	..	2	.11
0779 AB	Gear, crankshaft	7	1	1	14	3.60

PARTS AND PRICE LIST MODEL "DI" TRACTOR (Continued)

Part No.	Description	Page No.	Qty. Used	Weight Each		Price Each
				Lbs.	Oz.	
0789 AB	Gasket, oil pan hand hole screw, and clutch shaft bearing retainer ring screw	6, 34	20	..	1/25	.06
0794 AB	Thrower, oil, crankshaft	7	1	3	..	.17
0796 AB	Retainer, front, crankshaft felt	7	1	..	5	.17
0801 AB	Washer, felt, crankshaft	7	1	..	1	.22
0806 AB1	Gasket, breather elbow .	6	1	..	1/25	.15
0807 AB	Screw, cap, gear shifter	46	9	..	1	.11
0809 AB	Spring, gear shifter plunger	46	3	..	1/2	.11
0825 AB	Stud, cylinder head . .	6	14	..	1/8	.17
0843 AB	Stud, valve rocker arm bracket, long	8	2	..	3	.17
0844 AB2	Spring, inlet and exhaust valve	8	8	..	3	.35
0855 AB	Pin, oil pump drive gear	16	1	..	1	.06
0861 AB	Reinforcement for radiator header, front . .	22	1	..	9	.17
0862 AB	Reinforcement for radiator header, rear . . .	22	2	..	5	.11
0865 AB	Gasket, radiator cap . .	22	1	..	1/2	.22
0869 AB	Finger, governor	14	1	..	1	.30
0871 AB1	Ring, snap, governor thrust bearing	14	1	..	1/12	.06
0872 AB1	Pin, governor weight . .	14	2	..	1	.17
0877 AB	Pin, starting crank handle	24	1	..	5	.22
0878 AB	Handle, starting crank .	24	1	..	4	.17
0886 AB	Ferrule, intake manifold	10	2	..	1/2	.11
0887 AB	Ferrule, exhaust manifold	10	4	..	1	.11
0889 AB	Gasket, carburetor . . .	13	1	..	1/2	.11
0891 AB	Gasket, intake and exhaust manifold	10	2	..	2	.23
0895 AB	Clamp, air cleaner . . .	10	1	..	12	.30
0897 AB	Strap, clamp, air cleaner	10	1	..	4	.30
0907 AB	Washer, power take off shaft	48	1	..	4/5	.06
0908 AB	Washer, thrust, cam shaft	8	1	..	1/4	.17
0945 AB	Screw, push rod adjusting	8	8	..	1/4	.17
0947 AB1	Bushing, valve rocker arm	8	8	..	1	.15
0966 AB	Gasket, oil filler plug.	14	1	..	1/4	.06
0970 AB	Washer, lock, cam shaft nut	8	1	..	1/4	.07
0971 AB	Nut, camshaft. (1-1/8"-12 thread hexagon) . .	8	1	..	4	.30
0972 AB	Button, thrust, cam shaft	8	1	..	2	.22
0995 AB	Plunger, gear shifter . .	46	3	..	1/2	.22
01036 AB	Gasket, fuel tank cap . .	25	1	..	1/30	.11
01113 AB	Washer, transmission flange bolt, and spacer washer for fire extinguisher bracket	37	4	..	1/4	.06

PARTS AND PRICE LIST MODEL "DI" TRACTOR (Continued)

Part No.	Description	Page No.	Qty. Used	Weight Each		Price Each
				Lbs.	Oz.	
01116 AB1	Gasket, carburetor adapter.	10	1	..	1-1/10	.11
01178 AB	Gear, oil pump drive . . .	16	1	..	5	1.65
01180 AB	Washer, thrust, oil pump drive gear	16	1	..	1/2	.11
01182 AB	Shaft, stub, oil pump. . .	16	1	..	3	.40
01183 AB	Gear, without keyway, oil pump	16	1	..	6	1.65
01184 AB	Gear, with keyway, oil pump	16	1	..	6	1.65
01189 AB	Gasket, oil pump screen flange	16	1	..	1/12	.11
01209 AB1	Plunger, thrust, cam shaft.	8	1	..	1	.35
01237 AB	Lock, front axle king pin.	56	2	..	3	.22
01239 AB	Plug, steering spindle . .	57	4	..	6	.30
01241 AB	Ball, steering arm	50	1	..	8	.55
01246 AB	Nut, rear axle shaft . . .	60	2	2	4	1.95
01255 AB	Stud, rear axle housing. .	37	6	..	7	.17
01291 AB1	Spring, hand brake band adjusting rod.	42	1	..	3	.17
01292 AB	Washer, end of transmission sliding gear shaft, for hand brake pulley	40	1	..	3	.11
01352 AB	Pin, starting crank. . . .	24	1	..	2	.17
01361 AB	Gasket, lower, radiator inlet elbow.	22	1	..	1/2	.11
01405 AB	Gasket, clutch hand hole cover.	37	2	..	1/4	.11
01440 AB	Spring, cam shaft thrust plunger.	8	1	..	1/6	.11
01441 AB	Weight, governor	14	2	..	6	1.40
01453 AB	Cup, rear axle bearing Timken No. 563	60	4	1	7	4.65
01459 AB1	Bearing, thrust, governor shaft; purchased from Aetna Ball Bearing Mfg. Co., Chicago, Ill. Their No. A1506 . .	14	1	..	2	.90
01461 AB	Cup, front wheel outer bearing. Timken No. 14274.	57	2	..	5	.65
01462 AB	Cone, front wheel outer bearing. Timken No. 14125.	57	2	..	7	1.85
01498 AB	Screw, set, front axle pivot pin.	56	1	4	6	.17
01521 AB	Screw, set, governor arm .	14	1	..	1/3	.11
01528 AB1	Washer, lock, steering spindle.	57	2	..	1	.11
01532 AB	Washer, steering shaft . .	50	1	..	2	.11
01544 AB	Cone, front wheel inner bearing. Timken No. 358.	57	2	..	13	2.95
01579 AB	Stud, carburetor to manifold, long	10	1	..	1	.11
01581 AB	Stud, air cleaner clamp. .	10	1	..	1	.11
01593 AB3	Gasket, cylinder head. . .	6	1	..	10	1.15

PARTS AND PRICE LIST MODEL "DI" TRACTOR (Continued)

Part No.	Description	Page No.	Qty. Used	Weight Each		Price Each
				Lbs.	Oz.	
01594 AB1	Gasket, cylinder head cover.	6	1	..	2	.55
01595 AB	Gasket, oil pan to cylinder block.	6	2	..	2	.22
01596 AB	Clamp, manifold.	10	2	..	12	.80
01604 AB	Shaft, oil pump drive. .	16	1	..	14	1.10
01605 AB	Gasket, timing gear cover.	6	1	..	1	.17
01608 AB	Stud, manifold clamp . .	10	4	..	3	.17
01609 AB	Screw, crank shaft bearing cap.	7	6	..	8	.30
01612 AB	Gasket, cylinder inlet elbow and radiator outlet elbow	22	2	..	1/6	.17
01613 AB	Hose, radiator	22	1	..	4	.30
01615 AB	Gasket, transmission case rear cover.	48	1	..	1/2	.30
01616 AB	Cover, front, power take off.	48	1	..	5	.40
01623 AB	Shim, clutch shaft bearing carrier. No. 30 gauge.	34	4	..	1/2	.11
01626 AB	Shaft, sliding gear. . . .	40	1	20	6	13.20
01642 AB	Shim, differential shaft bearing carrier. No. 30 gauge	44	12	..	1	.11
01643 AB	Shim, first reduction shaft bearing carrier, and sliding gear shaft bearing carrier. No. 30 gauge	38, 40	16	..	1/3	.11
01658 AB	Lining, hand brake band. .	42	1	..	4	.55
01659 AB	Pin, hand brake band . .	42	1	..	1	.11
01660 AB	Rod, hand brake adjusting.	42	1	..	6	.30
01662 AB	Strap, hand brake lever. .	42	1	..	8	.40
01663 AB	Loop, hand brake band. .	42	1	..	2	.17
01664 AB	Lug, hand brake band . .	42	1	..	3	.17
01669 AB	Pin, king, front axle. . .	57	2	1	15	1.65
01672 AB	Rod, tie, front axle . . .	50	1	4	..	.85
01703 AB	Screw, crankshaft felt retainer	7	3	..	1/8	.06
01720 AB	Bearing, power take off shaft, rear end. New Departure No. 1207 . .	48	1	..	12	3.50
01721 AB	Shaft, governor arm. . . .	14	1	..	4	.80
01758 AB1	Shaft, valve rocker arm. .	8	2	..	14	2.20
01759 AB	Spring, long, valve rocker arm shaft	8	2	..	1/4	.11
01760 AB	Washer, felt, governor shaft bearing.	14	1	..	1/50	.06
01763 AB	Washer, thrust, governor gear	14	1	..	1	.11
01764 AB	Nut, governor shaft. . . .	14	1	..	1/2	.11
01765 AB1	Lock, governor shaft nut .	14	1	..	1	.03
01768 AB	Shim, crank shaft bearing.	7	6	..	2	.65
01770 AB	Rod, push.	8	8	..	7	.55
01771 AB	Shim, clutch shaft bearing carrier. .005" thick.	34	4	..	1/5	.11

PARTS AND PRICE LIST MODEL "DI" TRACTOR (Continued)

Part No.	Description	Page No.	Qty. Used	Weight Each		Price Each
				Lbs.	Oz.	
01772 AB	Shim, differential shaft bearing carrier. .005" thick.	44	12	..	1/4	.11
01773 AB	Shim, first reduction shaft bearing carrier, and sliding gear shaft bearing carrier. .005" thick.	38, 40	16	..	1/10	.11
01784 AB1	Pawl, hand brake lever	42	1	..	3	.17
01785 AB1	Bolt, hand brake lever pawl	42	1	..	1	.11
01787 AB	Nipple, radiator drain	22	1	..	2	.17
01798 AB	Ring, rubber, ignition wires.	26	1	..	1/6	.11
01815 AB	Nut, power take off shaft.	48	1	..	1	.35
01816 AB	Washer, power take off shaft, front	48	1	..	1	.17
01818 AB	Clutch, gear, power take off.	48	1	2	5	4.40
01822 AB	Collar, power take off shaft.	48	1	..	4	.40
01823 AB2	Spacer, power take off shaft.	48	1	..	5	.45
01857 AB	Cone, rear axle bearing. Timken No. 567	60	4	2	7	6.55
01920 AB	Fork, power take off shifter.	46	1	1	..	1.40
01937 AB	Bolt, connecting rod	7	8	..	3	.45
01948 AB	Spring, foot brake lever	63	2	..	4	.30
01962 AB	Cover, clutch hand hole.	37	2	1	..	.30
01970 AB	Spring, starting crank	24	1	..	1/2	.11
01971 AB	Washer, starting crank spring	24	1	..	1/4	.06
01981 AB	Packing, cylinder barrel	7	4	..	2	.30
01982 AB	Wrench, hub cap.	69	1	3	6	1.40
02003 AB	Screw, adjusting, steering gear drag link	50	2	..	4	.35
02004 AB	Bearing, steering gear drag link.	50	4	..	2	.30
02005 AB	Spring, steering gear drag link.	50	2	..	2	.17
02067 AB	Bolt, flywheel	7	6	..	1	.22
02068 AB	Bolt, transmission dowel	37	1	..	1	.22
02102 AB1	Link, roller, for 04487-AB1 roller chain 1-1/2" pitch x 7/8" dia. x 1" wide roller. Purchased from Whitney Mfg. Co., Hartford, Conn. for their chain No. 8-120XHR	60	8	.55
02103 AB1	Link, connecting, for 04487 AB1 roller chain 1-1/2" pitch x 7/8" dia. x 1" wide roller. Purchased from Whitney Mfg. Co., Hartford, Conn. for their chain No. 8-120XHR	60	10	.40

PARTS AND PRICE LIST MODEL "DI" TRACTOR (Continued)

Part No.	Description	Page No.	Qty. Used	Weight Each		Price Each
				Lbs.	Oz.	
02142 AB	Stud, timing gear cover.	6	1	..	1/2	.11
02144 AB	Gasket, power take off front cover.	48	1	..	1/6	.11
02148 AB	Dowel, crankshaft bearing cap.	7	12	..	1/8	.06
02204 AB	Gauge, valve clearance .	8	1	..	1/4	.11
02230 AB	Washer, front axle spring shackle pin, and rear wheel brake cam shaft.	56, 63	6	..	1	.11
02249 AB	Cover, oil pan hand hole	6	4	1	..	.35
02347 AB	Clip for generator wire.	26	1	..	1/10	.06
02439 AB1	Axle, front.	56	1	42	..	16.50
02473 AB	Gasket, gear shift lever ball socket.	46	1	..	1/18	.11
02490 AB	Spring, rear wheel brake shoe	62	4	..	4	.22
02499 AB	Pin, yoke end.	33, 62	8	..	2	.17
02507 AB	Shackle, spring.	56	2	2	..	4.40
02508 AB	Pin, spring shackle hanger	56	2	3	..	4.40
02509 AB	Bolt, spring shackle . .	56	2	..	7	1.10
02510 AB	U-bolt, front axle spring	56	2	..	14	.50
02512 AB	Bumper, rubber, front spring	24	1	..	1	1.00
02513 AB	Pin, front axle pivot. .	56	1	1	8	.95
02515 AB	Ball, radius rod	56	1	2	..	1.95
02516 AB	Stud, ball socket, front	6, 56	1	..	3	.11
02517 AB	Stud, ball socket, rear.	6, 56	2	..	3	.17
02518 AB1	Shaft, wheel brake cross	62	1	5	4	1.40
02519 AB1	Shaft, wheel brake cam .	62	2	3	10	4.40
02523 AB1	Rod, brake, cross shaft to cam shaft	62	2	1	1	.40
02524 AB1	Rod, brake, equalizer to cross shaft.	63	2	1	1	1.10
02527 AB1	Pin, brake shoe anchor .	62	2	1	1	1.10
02544 AB	Spring, front axle . . .	56	1	24	8	7.70
02566 AB	Bearing, thrust, front axle. Timken No. T-126.	57	2	..	5	.60
02696 AB1	Belt, fan.	20	1	..	13	1.20
02699 AB	Angle, draw bar.	55	2	3	..	.80
02701 AB	End, yoke, brake rod and clutch throwout rod. .	33, 62	5	..	5	.45
02726 AB2	Rod, clutch foot pedal to clutch throwout shaft.	33	1	1	9-1/2	.40
02731 AB	Washer, valve spring retainer	8	8	..	1	.11
02748 AB1	Facing, clutch; purchased from Rockford Drilling Machine Co., Rockford, Ill. Their No. CL-1523-1.	32	6	..	1	.45
02749 AB1	Facing, clutch; purchased from Rockford Drilling Machine Co., Rockford, Ill. Their No. CL-1524-1.	32	6	..	1	.45

PARTS AND PRICE LIST MODEL "DI" TRACTOR (Continued)

Part No.	Description	Page No.	Qty. Used	Weight Each		Price Each
				Lbs.	Oz.	
02752 AB1	Spring, clutch pressure; purchased from Rockford Drilling Machine Co., Rockford, Ill. Their No. CL-2317-9.	32	15	3	5	.22
02756 AB1	Spring, lock, clutch lever; purchased from Rockford Drilling Machine Co., Rockford, Ill. Their No. CL-3782.	32	3	..	1	.17
02757 AB2	Screw, adjusting, clutch lever; purchased from Rockford Drilling Machine Co., Rockford, Ill. Their No. CL-4066.	32	3	..	1	.30
02760 AB1	Pin, clutch lever; purchased from Rockford Drilling Machine Co., Rockford, Ill. Their No. CL-3739.	32	3	3	2	.07
02762 AB1	Rivet for clutch facing; purchased from Rockford Drilling Machine Co., Rockford, Ill. Their No. CL-1525.	32	36	1	1/38	.01
02792 AB	Plate, front axle spring	56	1	2	..	.40
02825 AB	Clip, oil filter tube and front head lamp wire	18, 26	3	..	1/4	.06
02846 AB	Gasket, oil pump screen flange, cap screw.	16	4	..	1/50	.06
02849 AB	Spacer, power take off mounting plate	48	4	..	1	.11
02856 AB	Washer, steering gear worm wheel shaft	50	2	..	1	.11
02868 AB	Key for water pump and fan shaft.	20	1	..	1/3	.11
02887 AB1	Washer for front axle spindle.	57	2	..	1	.11
02979 AB2	Rod for hand brake lever	42	1	..	4	.35
02994 AB	Bracket, tail lamp	26	1	..	6	.40
03011 AB	Gasket between rear axle housing and transmission	60	2	..	2	.25
03016 AB1	Dowel, transmission case and cylinder block	37	1	..	2	.22
03017 AB	Screw, starting motor.	26	1	..	3	.30
03020 AB	Gasket, transmission case front end	37	1	..	1	.35
03084 AB	Wire, generator to ammeter.	26	1	..	2	.40
03093 AB	Clip, starting cable to cylinder block	26	1	..	1	.11
03145 AB	Spring, second and reverse gear lockout	46	1	..	1/2	.22
03155 AB	Lock for water pump and fan shaft nut.	20	1	..	1/3	.11
03190 AB	Clip for wheel brake pedal return spring.	63	1	..	1	.06

PARTS AND PRICE LIST MODEL "DI" TRACTOR (Continued)

Part No.	Description	Page No.	Qty. Used	Weight Each		Price Each
				Lbs.	Oz.	
03209 AB	Equalizer for rear wheel brake.	63	1	.	8	.50
03210 AB	Stud for rear axle housing.	37	6	..	6	.17
03223 AB	Screw, set, fan drive pulley	7, 20	1	..	1	.11
03226 AB	Bolt, transmission flange	37	2	..	7	.30
03272 AB	Gasket, water pump	20	1	..	1/2	.17
03280 AB1	Screw, set, clutch brake adjusting collar	33	1	..	1	.17
03282 AB	Spring, clutch brake shoe	33	1	..	1	.17
03293 AB	Union, tire pump to air hose	65	1	..	1-1/8	.30
03296 AB	Belt, tire pump.	65	1	..	12	2.75
03312 AB	Key, tire pump pulley.	65	1	..	1/2	.11
03317 AB	Wrench, socket, for rear axle nut	69	1	16	..	2.20
03321 AB	Pump S-1055, tire. Kellogg No. 241 single cylinder; purchased from Kellogg Mfg. Co., Rochester, N. Y.	65	1	12	6	38.50
03417 AB	Bolt, dowel, oil pan to cylinder block	6	2	..	1	.11
03430 AB1	Bushing, steering worm shaft.	50	1	..	4	.25
03432 AB	Wire, ignition, magneto to No. 1 and No. 2 cylinder	26	2	..	2	.45
03444 AB	Bolt, seat channel pivot	53	1	..	8	.30
03450 AB	Gasket, magneto bracket.	14	1	..	1/10	.17
03457 AB	Washer, gear shifter shaft end.	46	4	..	1/2	.06
03458 AB	Gasket, gear shifter shaft end washer	46	4	..	1/50	.06
03501 AB	Ball, gear shift lever	46	1	..	4	.55
03601 AB1	Ammeter; purchased from Rochester Mfg. Co. Inc., Rochester, N. Y. Their No. 4000	26	1	..	6	.85
03609 AB	Lamp, tail; purchased from Guide Lamp Co., Anderson, Ind. Their Model No. 225A	26	1	..	12	.85
03620 AB	Plunger, oil pump relief	16	1	..	1	.11
03622 AB	Insert, exhaust valve seat	8	4	..	1/2	.55
03626 AB	Stud, carburetor to manifold, short.	10	1	..	1/3	.11
03634 AB	Screen, breather, cylinder head cover	6	12	..	1/12	.06
03640 AB	Wrench, spark plug	69	1	..	9	.30
03674 AB	Plunger, power take off gear shifter	46	1	..	1	.17
03827 AB	Key, rear axle	60	2	..	7	.40
03857 AB	Bushing, draw bar support.	55	4	..	4	.30
03869 AB	Seal, oil, governor shaft.	14	1	..	2	.50

PARTS AND PRICE LIST MODEL "DI" TRACTOR (Continued)

Part No.	Description	Page No.	Qty. Used	Weight Each		Price Each
				Lbs.	Oz.	
03899 AB	Seal, oil, power take off shaft.	48	1	..	4	.65
03938 AB	Seat, steering gear drag link	50	2	..	4	.20
04048 AB	Seal, oil, sliding gear shaft.	40	1	..	3	1.10
04234 AB	Spring, oil pump relief plunger.	16	1	..	1/2	.11
04240 AB	Seal, oil, steering drop arm shaft.	50	1	..	3	.55
04244 AB	Seal, oil, power take off shifter shaft. . .	46	1	..	1/2	.40
04253 AB1	Seal, oil, rear axle . .	60	2	..	9	1.80
04290 AB	Gasket, upper, radiator inlet elbow.	22	1	..	1	.17
04310 AB1	Block, clutch release lever; purchased from Rockford Drilling Machine Co., Rockford, Ill. Their No. CL-4067	32	3	6	1	.11
04311 AB1	Nut, check, clutch lever adjusting screw; purchased from Rockford Drilling Machine Co., Rockford, Ill. Their No. CL-4068.	32	3	..	1/6	.11
04370 AB	Gauge, oil pressure; purchased from Rochester Mfg. Co., Inc., Rochester, N. Y.	52	1	..	6	1.25
04372 AB1	Gauge, temperature, instrument panel to radiator elbow; purchased from Rochester Mfg. Co., Inc., Rochester, N. Y. Their Model VTCC	52	1	..	11	2.50
04378 AB	Ring, snap, governor weight pin	14	4	..	1/24	.06
04379 AB	Plug, governor shaft . .	14	1	..	1/10	.11
04384 AB	Gasket, rear axle dust guard.	60	2	..	1/10	.11
04385 AB	Guard, dust, rear axle .	60	2	..	12	.30
04386 AB	Nut, lock, rear axle shaft.	60	2	2	4	1.10
04387 AB	Washer, lock, rear axle shaft.	60	2	..	5	.17
04403 AB	Spring, short, valve rocker arm shaft . . .	8	2	..	1/4	.11
04404 AB	Plug, valve rocker arm shaft.	8	2	..	1/3	.06
04405 AB	Tube, valve rocker arm oil feed	8	1	..	1-1/2	.30
04406 AB	Nut, oil pump relief . .	16	1	..	2	.17
04407 AB	Tube, oil pump inlet . .	16	1	..	11	1.10
04487 AB1	Chain, roller, rear axle drive; 36 links, 1-1/2" pitch, 7/8"x1" roller; purchased from Whitney Mfg. Co., Hartford, Conn. Their No. 8-120XHR	60	2	21	..	13.75

PARTS AND PRICE LIST MODEL "DI" TRACTOR (Continued)

Part No.	Description	Page No.	Qty. Used	Weight Each		Price Each
				Lbs.	Oz.	
04571 AB	Pulley, fan, drive hub half	20	1	..	13	1.10
04572 AB	Pulley, fan, adjustable half	20	1	..	9	1.10
04573 AB	Washer, lip, adjustable fan pulley	20	3	..	1/2	.06
04591 AB1	Clip, flexible choke control	10	1	..	1/2	.11
04595 AB	Nipple, starting terminal	26	3	..	1/3	.40
04599 AB	Clip, tail lamp wire . .	26	3	..	1/8	.11
04607 AB	Battery, storage—17 plate, 6 volt. "Sure Start 172". Lead washer type with no overflow vents; purchased from Electric Storage Battery Co., Philadelphia, Pa. . . .	26	1	46	..	17.50
04630 AB	Shaft, rear axle	60	2	51	2	26.40
04696 AB	Shim, clutch shaft bearing carrier. .003" thick.	34	2	..	1/7	.11
04697 AB	Shim, first reduction shaft bearing carrier. .003" thick.	38	4	.	1/7	.11
04776 AB	Reinforcement, front, radiator header bottom	22	1	..	10	.22
04777 AB	Shim, radiator	22	2	..	1/2	.17
04778 AB1	Shroud for radiator, lower.	22	1	..	5	.30
04779 AB1	Shroud for radiator, upper.	22	1	..	4	.30
04781 AB	Spring, radiator cap . .	22	1	..	1	.17
04786 AB	Bracket, hood clamp, front.	22	2	..	2	.11
04796 AB	Cushion, fuel tank . . .	54	6	..	1/20	.11
04797 AB	Bolt, hood tie, rear . .	22	4	..	1	.11
04823 AB1	Tube, overflow, for radiator	22	1	..	9	.40
04843 AB	Pinion, third speed, 23 tooth	38	1	4	8	6.05
04845 AB	Gear, reverse idler, 23 tooth	40	1	3	9	4.95
04847 AB	Gear, second and reverse sliding, 33 tooth. . . .	40	1	7	5	7.70
04848 AB	Gear, fourth speed sliding, 20 tooth. . . .	40	1	1	12	4.95
04851 AB	Cone, first reduction shaft bearing, R.H. or L.H. Timken No. 436	38	2	1	2	3.95
04852 AB	Seal, oil, first reduction shaft	38	1	..	4	.85
04853 AB	Shaft, first and third shifting	46	1	1	12	1.95
04854 AB	Shaft, second, fourth and reverse shifting . .	46	1	1	12	1.95
04855 AB	Fork, first and third gear	46	1	1	8	1.10
04856 AB	Fork, second and reverse gear	46	1	1	2	1.10

PARTS AND PRICE LIST MODEL "DI" TRACTOR (Continued)

Part No.	Description	Page No.	Qty. Used	Weight Each		Price Each
				Lbs.	Oz.	
04857 AB	Fork, fourth gear.	46	1	1	2	.85
04858 AB	Interlock, short, gear shifter.	46	1	..	4	.55
04859 AB	Interlock, long, gear shifter.	46	1	..	5	.55
04861 AB1	Lockout, second and reverse gear.	46	1	..	1	.22
04863 AB	Lever, gear shift.	46	1	2	13	4.15
04864 AB	Pin, gear shift lever ball socket.	46	2	..	1/4	.11
04865 AB	Seat, gear shift lever socket ring.	46	1	..	3	.22
04866 AB	Ring, snap, gear shift lever.	46	1	..	1/8	.17
04867 AB	Cap, gear shift lever socket.	46	1	..	2	.30
04868 AB	Stud, reverse idler gear	40	1	2	12	3.00
04905 AB	Strainer, fuel; purchased from Imperial Brass Mfg. Co., Chicago, Ill. Their No. 42949.	25	1	..	7	1.40
04930 AB	Bearing, rear end, clutch shaft. New Departure No. 5210 . .	34	1	1	12	8.00
04931 AB	Ring, retainer, clutch shaft bearing.	34	1	1	..	.85
04932 AB	Ring, snap, clutch shaft	34	1	..	1/5	.17
04933 AB	Seal, oil, clutch shaft.	34	1	..	3	.80
04935 AB	Wheel, steering; purchased from American Hard Rubber Co., Akron, Ohio. Their No. AW-174-H	50	1	3	14	3.00
04954 AB	Bracket, R.H., platform support.	54	1	6	10	1.65
04955 AB	Bracket, L.H., platform support.	54	1	6	12	1.65
04971 AB	Plate, draw bar.	55	1	14	8	2.50
04972 AB	Support, R.H., draw bar.	55	1	7	2	1.10
04973 AB	Support, L.H., draw bar.	55	1	7	2	1.10
04981 AB	Switch, starting; purchased from Electric Autolite Co., Toledo, Ohio. Their No. SW-01	26	1	..	5	.55
04990 AB	Carburetor; purchased from Zenith Carburetor Co., Detroit, Mich. Their Model 62-AXJ9. .	13	1	4	9	16.50
05054 AB	Wire, tail lamp.	26	1	..	1	.55
05077 AB1	Control, flexible choke; purchased from Clum Mfg. Co., Milwaukee, Wis.	13	1	..	4	.55
05086 AB	Seal, oil, clutch throw-out shaft.	33	2	..	1	.45
05157 AB	Nut, front axle tie rod yoke end pin	50	2	..	1/2	.17
05225 AB1	Wire, light switch to ammeter.	26	1	..	1	.22

PARTS AND PRICE LIST MODEL "DI" TRACTOR (Continued)

Part No.	Description	Page No.	Qty. Used	Weight Each		Price Each
				Lbs.	Oz.	
05328 AB	Plate, spring mounted pedestal	24	1	2	2	.85
05329 AB	Lining, rear wheel brake shoe	62	4	..	14	2.55
05358 AB	Tube, clutch shaft bearing carrier	34	1	..	6	.85
05359 AB	Bearing, clutch release; purchased from Aetna Ball Bearing Mfg. Co., Chicago, Ill. Their No. A959-1 Type T.	33, 34	1	1	..	2.50
05364 AB	Screw, clutch shaft bearing retainer ring.	34	4	..	1/2	.11
05382 AB	Ring, snap, power take off shaft.	48	1	..	1/12	.11
05386 AB	Plate, power take off guard mounting	48	1	1	9	.55
05400 AB	Shaft, power take off.	48	1	20	3	12.65
05431 AB	Gear, low-low and third sliding, 29 and 40 tooth.	40	1	16	12	12.65
05450 AB	Screen, radiator	23	1	5	..	1.40
05451 AB	Bracket, radiator screen angle.	23	4	1	..	.11
05452 AB	Frame, radiator screen, R.H. side.	23	1	1	4	.45
05453 AB	Frame, radiator screw, L.H. side.	23	1	1	4	.45
05454 AB	Bottom, radiator screen frame.	23	1	1	..	.45
05455 AB	Shield, radiator bottom.	23	1	..	6	.55
05456 AB	Plate, platform, R.H.	54	1	11	14	2.75
05457 AB	Plate, platform, L.H.	54	1	11	8	2.75
05459 AB	Support, tool box.	54	2	..	8	.30
05565 AB	Gear, flywheel ring.	7	1	3	2	3.30
05566 AB	Motor, starting; purchased from Electric Auto Lite Co., Toledo, Ohio. Their No. MAB-4105	26	1	24	14	17.60
05581 AB	Gasket, air cleaner box plate.	10	1	..	1	.22
05582 AB	Pad, lower, air cleaner filter	10	1	..	2	.65
05583 AB	Pad, upper, air cleaner filter	10	1	..	8	1.10
05584 AB	Screen, upper, air cleaner.	10	1	..	5	.30
05586 AB	Gasket, air cleaner reservoir.	10	1	..	1/2	.17
05598 AB	Wire, starter switch to ammeter.	26	1	..	1	.30
05634 AB	Loom, flexible choke control (7/32" I. dia. x42" long, non-metallic conduit)	13	1	..	1	.17
05638 AB	Spark plug; purchased from A.C. Spark Plug Co., Flint, Mich. Their No. 1557092.	26	4	..	4	.65
05698 AB	Clamp, rear wheel rim.	60	12	..	10	.30

PARTS AND PRICE LIST MODEL "DI" TRACTOR (Continued)

Part No.	Description	Page No.	Qty. Used	Weight Each		Price Each
				Lbs.	Oz.	
05781 AB	Seal, water pump, flexible; purchased from Schwitzer-Cummins Co., Indianapolis, Ind. Their No. C105-710 . .	20	1	..	1/10	.40
05782 AB	Ring, water pump seal clamp; purchased from Schwitzer-Cummins Co., Indianapolis, Ind. Their No. C-19895. . .	20	1	..	1/30	.11
05783 AB	Spring, water pump seal; purchased from Schwitzer-Cummins Co., Indianapolis, Ind. Their No. C-106658 . .	20	1	..	1/6	.30
05784 AB	Guide, water pump flexible seal spring; purchased from Schwitzer-Cummins Co., Indianapolis, Ind. Their No. C105762.	20	1	..	1/14	.17
05785 AB	Washer, water pump carbon seal; purchased from Schwitzer-Cummins Co., Indianapolis, Ind. Their No. C105704.	20	1	..	1/6	.45
05786 AB	Ring, snap, water pump impeller; purchased from Schwitzer-Cummins Co., Indianapolis, Ind. Their No. C19395	20	1	..	1/36	.06
05947 AB	Bolt for seat spring . .	53	1	..	12	.40
05948 AB	Spring, seat, large. . .	53	1	1	1	.40
05954 AB	Hinge, seat.	53	1	..	14	.55
05956 AB	Bolt, seat hinge	53	1	..	8	.17
05957 AB	Bracket, seat rear support	53	1	1	5	.40
05958 AB	Bumper, seat rear support	53	2	..	1/2	.06
06018 AB	Cup for sliding gear shaft bearing. Timken No. 33821.	40	2	..	10	2.20
06036 AB	Pin, gear shifter interlock	46	1	..	1	.22
06055 AB	Bushing, steering spindle.	57	4	..	3	.35
06102 AB	Bushing, power take off gear	48	1	..	4	.65
06141 AB	Cushion, seat.	53	1	1	11	2.75
06152 AB	Ring, snap, steering worm bearing retainer washer	50	1	..	1/4	.06
06153 AB	Lining, clutch brake shoe	33	1	..	1/2	.17
06162 AB	Guide, radiator shutter control.	23	1	..	1	.11
06163 AB	Nut, radiator shutter control.	23	2	..	5	.17
06164 AB	Screw, radiator shutter control.	23	1	..	5	.45

PARTS AND PRICE LIST MODEL "DI" TRACTOR (Continued)

Part No.	Description	Page No.	Qty. Used	Weight Each		Price Each
				Lbs.	Oz.	
06165 AB	Connector, radiator shutter control.	23	1	..	6	.45
06168 AB	Clip, radiator shutter rear control rod	23	1	..	1/10	.06
06169 AB	Connection, radiator shutter control rod. . .	23	1	..	1	.11
06182 AB	Clip, strainer to carburetor tube.	10	1	..	1/3	.06
06194 AB	Clip for cable	26	1	..	2	.11
06221 AB	Spring for throttle lever.	54	1	..	1/10	.06
06322 AB	Rod, front, throttle control.	54	1	..	6	.30
06324 AB	Clip, engine hour meter ground wire.	66	1	..	1/2	.06
06330 AB	Head lamp; purchased from Guide Lamp Co., Anderson, Ind. Their No. 524M	26	2	2	..	4.95
06348 AB	Bumper, rubber, seat channel.	53	1	..	3	.85
06349 AB	Washer, seat channel spring bolt.	53	1	..	4	.06
06352 AB	Switch, magneto; purchased from H. A. Douglas Mfg. Co., Bronson, Mich. Their No. 5877	26	1	..	1	.45
06353 AB	Switch, light; purchased from H. A. Douglas Mfg. Co., Bronson, Mich. Their No. 5878.	26	1	..	3	.55
06437 AB	Clamp, muffler pipe.	12	1	..	7	.30
06511 AB	Coupling, magneto.	14	1	..	9	1.40
06619 AB	Wire, ignition, magneto to No. 3 and No. 4 cylinder	26	2	..	1	.40
06704 AB	Screw, set, shifter shaft.	46	2	..	1	.11
06725 AB	Bushing, steering shaft column	50	1	..	1-1/2	.45
06735 AB	Washer, rear axle housing stud	37	6	..	3/4	.11
06889 AB	Step, mounting	55	1	3	4	.65
07029 AB	Clamp, choke rod control wire	13	1	..	1/2	.11
07036 AB	Channel, seat.	53	1	11	11	1.65
07042 AB	Cone, differential shaft bearing. Timken No. 29685.	44	2	1	5	5.15
07043 AB	Cup, differential shaft bearing. Timken No. 29620.	44	2	..	10	2.90
07044 AB	Gear and sprocket, differential.	44	2	8	13	12.65
07048 AB	Cone, sliding gear shaft bearing. Timken No. 33885.	40	2	1	8	4.60
07054 AB1	Bushing, steering spindle arm.	50	2	..	1/2	.15

PARTS AND PRICE LIST MODEL "DI" TRACTOR (Continued)

Part No.	Description	Page No.	Qty. Used	Weight Each		Price Each
				Lbs.	Oz.	
07057 AB	Cup, front wheel inner bearing. Timken No. 354A	57	2	..	6	1.75
07058 AB	Seal, front wheel.	57	2	..	1	1.10
07059 AB	Retainer, front wheel seal	57	2	..	7	.22
07060 AB	Seal, front wheel retainer	57	2	..	1/6	.30
07061 AB	End, yoke, front axle tie rod.	50	2	..	12	1.10
07062 AB	Pin, front axle tie rod yoke end	50	2	..	5	.45
07082 AB	Hub, fan	20	1	..	14	1.10
07083 AB	Blade, fan, assembly; purchased from Schwitzer-Cummins Co., Indianapolis, Ind. Their No. BF-07146 . .	20	1	3	12	2.50
07084 AB	Ring, snap, water pump body	20	1	..	1/8	.11
07085 AB	Shaft, water pump and fan.	20	1	1	3	3.00
07086 AB	Bearing, water pump and fan shaft. New Departure No. 8604	20	1	..	8	2.95
07091 AB	Stud, short, air cleaner oil trap	10	1	..	2	.17
07092 AB	Stud, long, air cleaner oil trap	10	1	..	5	.30
07093 AB	Core with header, radiator; purchased from Modine Mfg. Co., Racine, Wis. Their No. AD3590	22	1	14	..	25.30
07096 AB	Rod, governor lever to carburetor	54	1	..	3	.30
07098 AB	Shutter, radiator; purchased from Pines Winterfront Co., Chicago, Ill.	23	1	7	..	6.35
07099 AB	Rod, rear, radiator shutter control.	23	1	..	6	.55
07100 AB	Generator; purchased from Electric Auto Lite Co., Toledo, Ohio. Their No. GAS-4167	26	1	15	..	26.05
07103 AB	Strap, generator belt adjusting.	26	1	..	4	.17
07104 AB	Pulley, generator drive.	20, 26	1	..	13	.85
07105 AB	Belt, generator.	20, 26	1	..	3	.70
07106 AB	Panel, instrument.	52	1	2	2	1.50
07110 AB	Shaft, power take off shifter.	46	1	1	5	.85
07113 AB	Bushing, water pump.	20	1	..	2	.70
07143 AB	Bracket, magneto ground wire clip and generator wire clip.	26	2	..	3	.11
07144 AB	Screw, cap, fastens 07147 AB throttle control rod bracket to timing gear cover. . . .	6	1	..	6	.11

PARTS AND PRICE LIST MODEL "DI" TRACTOR (Continued)

Part No.	Description	Page No.	Qty. Used	Weight Each		Price Each
				Lbs.	Oz.	
07145 AB	Elbow, fuel strainer . .	25	1	..	1	.17
07147 AB	Bracket, throttle con- trol front rod	54	1	..	3	.17
07159 AB	Support, strainer to carburetor tube. . . .	10	1	..	2	.11
07160 AB	Shield, generator. . . .	26	1	..	7	.15
07161 AB	Spring, governor	14, 54	1	..	1	.17
07162 AB	Rod, front, radiator shutter control. . . .	23	1	..	3	.22
07163 AB	Roller assembly, steer- ing gear bearing. Timken No. 11BC. . . .	50	2	..	1	.70
07164 AB	Cone, steering gear bearing. Timken No. 12CB	50	2	..	2	.90
07165 AB	Cup, steering gear bear- ing. Timken No. 13C .	50	2	..	1	.65
07166 AB	Breather assembly, transmission, pur- chased from Industrial Wire Cloth Products Corp., Wayne, Mich. Their No. A-1854	46	1	..	2	.40
07167 AB	Shim, steering column. .003" thick.	50	3	..	1/4	.06
07168 AB	Shim, steering column. .005" thick.	50	3	..	1/2	.06
07169 AB	Shim, steering column. No. 30 gauge	50	4	..	1-1/4	.06
07172 AB	Wheel, steering worm . .	50	1	5	..	3.30
07173 AB	Shaft, steering drop arm	50	1	4	6	3.85
07174 AB1	Screw, adjusting, steer- ing drop arm shaft . .	50	1	..	8	.40
07175 AB	Plug, steering column end.	50	1	..	2	.06
07185 AB	Gasket, transmission case top cover	46	1	..	1	.35
07187 AB	Shaft, differential. . . .	44	1	11	..	6.90
07188 AB	Rod, throttle, hand lever to accelerator pedal.	54	1	..	8	.40
07196 AB	Wire, head lamp.	26	1	..	1	.40
07200 AB	Bracket, starting switch	26	1	..	4	.11
07201 AB	Cable, starting switch to starting motor. . .	26	1	..	15	1.10
07202 AB	Cable, battery to start- ing switch	26	1	..	15	1.10
07203 AB	Cable, battery ground. .	26	1	..	14	.90
07223 AB	Stud, rear wheel rim clamp.	60	12	..	2	.22
07234 AB	Stop, clutch lever	54	1	..	4	.35
07235 AB	Shaft, first reduction, with low speed pinion.	38	1	17	..	18.15
07241 AB	Stud, front wheel rim clamp.	57	8	..	1	.22
07242 AB	Nut, front wheel rim clamp stud	57	8	..	1	.11
07243 AB	Nut, rear wheel rim clamp stud	60	12	..	3	.11
07265 AB	Shaft, clutch throwout .	33	1	4	4	1.25

PARTS AND PRICE LIST MODEL "DI" TRACTOR (Continued)

Part No.	Description	Page No.	Qty. Used	Weight Each		Price Each
				Lbs.	Oz.	
07268 AB	Muffler; purchased from Nelson Muffler Corp., Stoughton, Wis. Their No. T-1413	12	1	5	8	3.50
07277 AB	Brace, R.H. for instrument panel	52	1	..	8	.10
07278 AB	Brace, L.H. for instrument panel	52	1	..	7	.10
07280 AB	Tube, oil pressure gauge to rear of cylinder block.	52	1	6	3	.35
07284 AB	Tube, fuel tank to carburetor.	25	1	..	4	.65
07292 AB	Shaft, governor.	14	1	1	4	2.50
07293 AB	Collar, thrust, governor shaft.	14	1	..	4	.35
07295 AB	Wire, magneto to magneto switch	26	1	6	3	.15
07299 AB	Packing, rubber, starting motor.	26	1	..	1/12	.12
07315 AB	Rod, rear, throttle control	54	1	..	12	.45
07339 AB	Washer, steering worm bearing retainer	50	1	..	1	.05
07407 AB	Loom, engine hour meter to switch. (7/32" I. dia. x 29" long, non-metallic flexible conduit.)	66	1	..	2	.15
07427 AB	Meter, engine hour; purchased from John W. Hobbs Corp., Springfield, Ill.	66	1	..	14	20.00
07428 AB	Switch, hour meter pressure; purchased from John W. Hobbs Corp., Springfield, Ill.	66	1	..	4	2.50
07429 AB	Adapter, pressure switch	66	1	..	2	.50
07461 AB	Purolator, or oil filter; purchased from Purolator Products Inc., Newark, N. J. Type PD-50-01. Their No. 25787.	18	1	6	2	13.00
07493 AB	Tube, oil filter, supply to tee	18	1	..	3	.50
07494 AB	Tube, oil filter, tee to governor	18	1	..	1	.40
07495 AB	Tube, oil filter inlet, tee to oil filter. . . .	18	1	..	2-1/2	.50
07496 AB	Tube, oil filter outlet, oil filter to cylinder block.	18	1	..	2	.45
07552 AB	Wire to lock 0807 AB gear shifter fork cap screw (No. 18 gauge x 7" long, soft annealed iron wire)	46	3	..	1/50	.01
07554 AB	Rim for front wheel. (4.50 E-16 full drop center rim without drive lugs.)	57	2	11	..	1.55

PARTS AND PRICE LIST MODEL "DI" TRACTOR (Continued)

Part No.	Description	Page No.	Qty. Used	Weight Each		Price Each
				Lbs.	Oz.	
07558 AB	Grease gun, 5 oz. capacity; purchased from the Lincoln Engineering Co., St. Louis, Mo. Their Model No. 5950	69	1	1	6	2.60
07565 AB	Wrench, double end 3/8x1/2; purchased from Vlchek Tool Co., Cleveland, Ohio. Their No. 723A	69	1	..	1-1/2	.15
07566 AB	Wrench, double end 7/16x9/16; purchased from Vlchek Tool Co., Cleveland, Ohio. Their No. 725A	69	1	..	3	.20
07567 AB	Wrench, double end 5/8"x3/4"; purchased from Vlchek Tool Co., Cleveland, Ohio. Their No. 729A	69	1	..	7	.30
07569 AB	Wrench, double end 15/16x1-1/16; purchased from Vlchek Tool Co., Cleveland, Ohio. Their No. 34A	69	1	1	5	.65
07583 AB	Valve, exhaust and inlet	8	8	..	6	1.30
07586 AB	Clamp, front wheel rim--Goodyear clamp No. 312	57	8	..	4	.30
07587 AB	Fire extinguisher; purchased from Pyrene Mfg. Co., Newark, N.J. Their No. C-21-T, their drawing No. B-9307	67	1	7	6	14.00
07588 AB	Bracket, fire extinguisher.	67	1	4	2	1.25
07589 AB	Rim for rear wheel; (8.00T-24 Goodyear semi drop center rim, (type L.T. with drive lugs.)	60	2	60	..	9.50
07596 AB	Clips, wire belt; purchased from Clipper Belt Lace Co., Grand Rapids, Mich.	65	24	..	1/20	.06
07597 AB	Rawhide for belt fastener, 1/8" dia. x1-7/8" long	65	1	..	1/25	.01
07598 AB	Wrench, 9" adjustable auto	69	1	..	11	.40
07599 AB	Wrench, double end 13/16"x1"; purchased from Vlchek Tool Co., Cleveland, Ohio. Their No. 732.	69	1	1	..	.40
02475 M	Spring, brake lever handle	42	1	..	1	.17
04256 TF	Spring, seat, small.	53	1	..	7	.30
TC-4324 A	Regulator, two charge.	26	1	1	3	5.50

4JMA-25 "CASE" MAGNETO

Part No.	Description	Page No.	Qty. Used	Weight Each		Price Each
				Lbs.	Oz.	
055 CM	Nut, primary	29	2	..	3/125	.03
059 CM	Washer, breaker bar screw	29	1	..	1/125	.06
062 CM	Cam.	29	1	..	7/125	.40
063 CM	Ring, snap	29	1	..	1/125	.04
010 JM	Gasket, cork, distribu- tor cap.	29	1	..	1/25	.10
018 JM	Nut, top cover stud. . .	29	2	..	7/125	.05
019 JM	Gear, fibre, distributor	29	1	..	3/8	1.00
024 JM	Washer, thrust, distrib- utor shaft	29	1	..	7/125	.05
026 JM	Brush, center.	29	1	..	1/125	.05
032 JM	Gasket, top cover. . . .	29	1	..	3/125	.10
040 JM	Gear, driving, on rotor shaft.	29	1	..	2/5	.50
044 JM	Washer, spacer	29	2	..	7/125	.05
067 JM	Plate, locking, for sta- tionary breaker point.	29	1	..	3/125	.05
072 JM	Flinger, oil	29	1	..	4/125	.05
082 JM	Spring, secondary. . . .	29	1	..	1/125	.03
094 JM	Plate, stop pin.	29	1	..	1-1/5	.25
095 JM	Nut for impulse.	29	1	..	1/5	.10
096 JM	Washer, tailed, impulse coupling	29	1	..	4/125	.05
0105 JM	Washer, fibre, on con- denser	29	1	..	3/125	.10
0113 JM	Spring, impulse coupling	29	1	..	2/3	.40
0125 JM	Spring, inside grounding	29	1	..	1/10	.05
0159 JM	Spring, outside grounding	29	1	..	3/125	.05
0167 JM	Screw, stop pin plate. .	29	3	..	6/125	.05
0183 JM	Strip, dielectric acetate insulation . .	29	1	..	7/125	.10
0185 JM	Seal, oil.	29	1	..	7/125	.25
0213 JM	Ball bearing. New De- parture No. 77502. . .	29	2	..	1-1/2	1.35
1 JMA	Frame.	29	1	4	1-1/2	10.00
4 JMA-25	"Case" magneto assembly.	25	1	7	2	39.50
10 JMA	Rotor.	29	1	1	1-1/2	15.00
11 JMA	Plate, bearing	29	1	..	5	2.00
13 JMA	Disc, distributor, assembly	29	1	..	2	2.00
17 JMA	Bar, breaker, assembly .	29	1	..	1/4	1.10
18 JMA	Hub, impulse coupling, assembly	29	1	..	7	1.50
19 JMA	Condenser, assembly. . .	29	1	..	1-1/2	.75
20 JMA	Coil assembly.	29	1	1	3	8.00
26 JMA	Cap, distributor	29	1	..	10	3.50
32 JMA	Brush with spring, dis- tributor cap	29	4	..	1/65	.15
39 JMA	Cover, top	29	1	..	3	1.50
59 JMA	Support, breaker spring.	29	1	..	1/5	.25
68 JMA	Point, stationary break- er, assembly	29	1	..	1/10	.50
91 JMA	Shell, outer, impulse coupling	29	1	..	4-1/2	1.00

CARBURETOR

04990 AB Zenith Carburetor - Model 62-AXJ9
Purchased from Zenith Carburetor Division
Detroit, Michigan

Part No.	Description	Page No.	Qty. Used	Weight Each		Price Each
				Lbs.	Oz.	
B2-58-B	Body, throttle, assembly	13	1	1	4	3.50
B3-38-A	Bowl, fuel, assembly . .	13	1	2	5	9.00
C21-85	Plate, Throttle.	13	1	..	1	.70
C29-138	Shaft and lever, throttle	13	1	..	2	1.20
C38-19	Venturi, main, No. 22. .	13	1	..	1/2	1.10
C39-7	Venturi, secondary . . .	13	1	..	1/4	.75
C46-38	Needle, idle adjusting .	13	1	..	1/8	.30
C52-1	Jet, economizer No. 22 .	13	1	..	1/12	.35
C52-6	Jet, Main, No. 27. . . .	13	1	..	1/10	.75
C55-7	Jet, idling, No. 16. . .	13	1	..	1/12	.50
C66-22-1	Jet, main discharge, No. 65	13	1	..	1/6	.75
C71-21	Jet, main, adjusting assembly	13	1	..	1/2	.90
C77-18	Vent, well No. 34. . . .	13	1	..	1/24	.25
C81-1	Valves, fuel No. 40. . .	13	1	..	1/3	.75
C85-26	Float assembly	13	1	..	1/2	1.00
C101-2	Plate, air shutter	13	1	..	1/2	.75
C108-37	Shaft assembly, air shutter.	13	1	..	1	.90
C111-17	Spring, idle adjusting needle	13	1	..	1/25	.10
C117-27	Spring, air shutter lever.	13	1	..	1/50	.10
C120-15	Axle, float.	13	1	..	1/10	.10
C131-3x3	Packing, retainer. . . .	13	1	..	1/15	.05
C136-13	Screw, throttle plate. .	13	2	..	1/12	.05
C142-15	Gaskets, bowl to body. .	13	1	..	1/20	.15
CR24-85	Lever, throttle.	13	1	..	1/2	.60
CR88-7	Bracket, float	13	1	..	1/4	.10
CR121-8	Pin, throttle stop	13	1	..	1/15	.05
CR134-12	Swivel, air shutter lever.	13	1	..	1/10	.20
CT52-7	Packing, air shutter shaft.	13	1	..	1/15	.05
CT57-8	Packing, throttle shaft. .	13	2	..	1/15	.05
CT63-2	Pin, taper	13	1	..	1/15	.05
CT150-1	Cock, drain.	13	1	..	1/4	.25
T1S8-12	Screw, throttle stop . .	13	1	..	1/13	.05
T15B6-4	Screw, air shutter plate .	13	2	..	1/12	.05
T18S12-12	Screw, bowl to body. . .	13	4	..	1/10	.05
T41-12	Washer, lock, bowl to body screw	13	4	..	1/48	.05
T43-6	Washer, lock, air shutter screw.	13	2	..	1/40	.05
T56-4	Washer, fibre, economizer jet	13	1	..	1/50	.05
T56-23	Washer, fibre, main jet adjusting.	13	1	..	1/25	.05
T56-24	Washer, fibre, main jet. .	13	1	..	1/42	.05
T56-48	Washer, fibre, discharge jet.	13	1	..	1/38	.05

FUEL STRAINER

04905 AB Fuel Strainer - Their No. 42949
Purchased from Imperial Brass Mfg. Co.,
Chicago, Ill.

Part No.	Description	Page No.	Qty. Used	Weight Each		Price Each
				Lbs.	Oz.	
31322	Valve, needle, assembly.	24	1	..	1	.30
32275	Gasket, cork	24	1	..	1/35	.06
32276	Bowl, glass.	24	1	..	3	.17
32277	Cap and nut, assembly. .	24	1	..	2	.17
32278	Screen	24	1	..	1/30	.17
32279	Bale assembly.	24	1	..	3	.30
42949-1	Head, strainer	24	1	..	6	.55

OIL FILTER PARTS

07461 AB Oil Filter - Type PD-50-01 - Their No. 25787
Purchased from Purolator Products Inc., Newark, N. J.

Part No.	Description	Page No.	Qty. Used	Weight Each		Price Each
				Lbs.	Oz.	
25755	Screw, retaining	18	1	..	1½	.30
25756	Gasket for retaining screw.	18	1	..	1/10	.04
25757	Spring, element retaining.	18	1	..	1	.02
25789-2	Element assembly	18	1	..	10	2.00
25791	Cover assembly	18	1	..	1/3	1.25
25795	Plug, drain.	18	1	..	1/5	.05
25802	Gasket, cover.	18	1	..	¼	.10
25805	Case assembly.	18	1	4	4	6.30

GENERATOR

07100 AB Generator - Their No. GAS 4167
Purchased from the Electric Auto Lite Company,
Toledo, Ohio

Note:-For service parts on Electric Auto Lite Generator, order from
their nearest service station or direct from them at Toledo, O.

Part No.	Description	Page No.	Qty. Used	Weight Each		Price Each
				Lbs.	Oz.	
DA-39	Guard, oil, flat	27	1	..	1/10	.01
GAL-31	Connector, ground, assembly	27	1	..	1/10	.04
GAR-73	Wick, oil.	27	1	..	1/50	.03
GAR-98A	Cover, wick.	27	1	..	1/75	.01
GAR-171	Ring, snap	27	1	..	1/10	.02
GAS-15	Holder, brush.	27	1	..	1/10	.05
GAS-17	Spring, brush.	27	1	..	1/30	.05
GAS-18	Spring, brush.	27	1	..	1/30	.05
GAS-20	Screw, frame	27	2	..	7/100	.06
GAS-29	Pole piece	27	2	..	10-1/2	.50
GAS-44	Connections, field, insulating	27	1	..	1/20	.03
GAS-45	Holder, field coil	27	4	..	1/20	.01
GAS-51	Spring, 3rd brush plate retaining.	27	2	..	1/30	.04
GAS-103	Guard, cupped felt	27	1	..	1/8	.08
GAS-104	Retainer, bearing.	27	1	..	1/2	.10
GAS-121	Bushing, insulating.	27	1	..	1/60	.08
GAS-168	Spacer, T. C. regulator.	27	2	..	9/10	.15
GAS-217A	Head, drive end.	27	1	1	5	1.50
GAS-220	Guard, oil	27	1	..	1/8	.08
GAS-221	Gasket, oil retaining.	27	1	..	1/300	.03
GAS-223	Gasket	27	1	..	1/50	.02
GAS-224	Bearing, absorbent bronze	27	1	..	1/3	.20
GAS-225	Lead assembly.	27	1	..	1/5	.11
GAS-1005A	Coil, field, assembly complete	27	1	..	11	2.20
GAS-1007B	Coil, field, assembly, left	27	1	..	5	1.10
GAS-1008D	Coil, field, right	27	1	..	5	1.10
GAS-1021R	Plate, brush holder, part assembly.	27	1	..	7/16	.40
GAS-1024A	Band, head, assembly	27	1	..	2-3/8	.20
GAS-1217A	Head, drive end, assembly	27	1	1	8	4.00
GAS-1219R	Plate, 3rd brush holder, part assembly.	27	1	..	1/2	.25
GAS-1222	Cover, commutator end cap	27	1	..	1-1/8	.15
GAS-1229	Plate, commutator end, part assembly.	27	1	1	5	2.65
GAS-2021R	Plate, brush holder, assembly	27	1	..	1	1.00
GAS-2218	Armature, assembly	27	1	3	3	10.00
GAS-2219R	Plate, 3rd brush holder.	27	1	..	3/4	.45
GAS-2229	Commutator end plate assembly	27	1	1	9	4.75
GAS-2240	Assembly, frame and field	27	1	6	3	5.35
GBM-21	Nut, armature shaft.	27	1	..	7/16	.05
GEM-12	Brush, main - See GEM-2012S.	27	2	..	3/50	.20
GEM-13	Brush, third - See GEM-2012S.	27	1	..	1/20	.20
GEM-2012S	Brushes, Set of.	27	1	..	1/5	.60
MN-21	Pin, dowel	27	2	..	1/40	.01
MZ-38	Screw, pole piece.	27	2	..	1/4	.02
SP-383	Pulley, drive.	27	1	1	..	3.20
TC-4324A	Regulator, two charge.	27	1	1	3	5.50
X-195	Washer, lock, #8	27	3	..	1/10	.05

GENERATOR (Continued)

Part No.	Description	Page No.	Qty. Used	Weight Each		Price Each
				Lbs.	Oz.	
X-196	Washer, lock, #10. . . .	27	4	..	1/50	.05
X-260	Key, Woodruff, #5. . . .	27	1	..	1/16	.05
X-441	Bearing, ball.	27	1	..	2-1/4	2.15
X-489	Oiler 1/4", press in type	27	1	..	1/20	.05
X-544	Washer, lock, 10	27	2	..	1/60	.05
X-714	Screw, #10-32X1-1/2"					
	round head	27	1	..	1/5	.05
X-755	Terminal	27	2	..	1/30	.05
X-864	Washer, lock, .669	27	1	..	7/16	.05
X-958	Terminal	27	2	..	1/20	.05
X-1423	Terminal	27	1	..	1/5	.05
8X-55	Screw, round head,					
	#8-32x3/8"	27	3	..	1/20	.05
8X-122	Screw, fillister head,					
	#8-32x1/2"	27	2	..	1/20	.05
8X-311	Screw, round head,					
	#10-32x3/8"	27	4	..	1/16	.05
8X-794	Nut, square, #10-32. . . .	27	1	..	1/20	.05
8X-878	Screw, fillister head,					
	#8-32x7/16"	27	1	..	1/20	.05
8X-888	Screw, fillister head,					
	#8-32x5/16"	27	4	..	1/20	.05
8X-1496	Screw, #8-32x7/16"	27	2	..	1/20	.05

STARTING MOTOR

05566 AB Starting Motor - Their No. MAB4105

Purchased from the Electric Auto Lite Co., Toledo, Ohio

Note: For service parts on Electric Auto Lite Starting Motor, order from their nearest service station or direct from them at Toledo, Ohio.

Part No.	Description	Page No.	Qty. Used	Weight Each		Price Each
				Lbs.	Oz.	
EB-108	Washer, lock	29	2	..	1/11	.01
EB-7806	Screw, head spring, long	29	1	..	1/2	.08
EB-7807	Screw, shaft spring, short.	29	1	..	1/2	.07
EB-7819-S	Sleeve, compression. . .	29	1	..	1/4	.30
EB-8503	Head, driving.	29	1	..	3-1/2	.45
EB-8705	Spring, drive.	29	1	..	8	.55
EB-8734	Spring, take up.	29	1	..	1/62	.01
EBA-2	Drive assembly, Bendix .	29	1	1	13	5.50
EBA-211	S-A assembly	29	1	1	..	3.90
GK-38	Screw, pole piece. . . .	29	4	..	1/3	.01
GT-20	Screw, frame	29	2	..	1/3	.08
MAB-12	Brush.	29	2	..	1/2	.25
MAB-29	Piece, pole.	29	4	..	7-1/2	.25
MAB-30	Insulation, field connection.	29	1	..	1/17	.01
MAB-31	Washer, insulating . . .	29	1	..	1/40	.01
MAB-85	Bushing, insulating. . .	29	1	..	1/70	.03
MAB-87	Felt, washer	29	1	..	1/23	.05
MAB-103	Gasket	29	1	..	1/26	.02
MAB-1007	Coil, field, upper left.	29	1	..	6-1/4	1.00
MAB-1008A	Coil and brush assembly, field, lower right. . .	29	1	..	6-1/4	1.25
MAB-1009B	Coil and brush assembly, field, lower left. . .	29	1	..	6-1/4	1.25
MAB-1010	Coil, field, upper right	29	1	..	6-1/4	1.00
MAB-1024G	Band, head, assembly . .	29	1	..	3	.15
MAB-1104	Plate, intermediate, assembly	29	1	..	2/5	2.50
MAB-2001	Frame and Field assembly.	29	1	9	13	7.90
MAB-2002	Plate, commutator end, assembly	29	1	..	10	1.35
MAB-2086	Armature assembly. . . .	29	1	7	1	9.00
MAF-59	Connector, field coil. . .	29	2	..	1/3	.03
MAN-14	Terminal	29	1	..	1/3	.08
MG-77-A	Bearing, absorbent bronze	29	1	..	1/3	.20
ML-21 A	Bearing, absorbent bronze	29	1	..	3/4	.20
ML-32	Washer, thrust	29	1	..	1/4	.01
MN-21	Pin, dowel	29	2	..	1/100	.01
MU-28	Post, terminal	29	1	..	1/2	.10
MU-37	Washer, 5/16" plain. . .	29	1	..	1/26	.01
MU-39	Washer, insulating . . .	29	1	..	1/20	.01
MU-54	Washer, thrust, 1/32" thick.	29	1	..	1/54	.01
MZ-16	Holder, brush.	29	2	..	1/5	.01
MZ-19	Spring, brush.	29	4	..	1/10	.05
MZ-1034	Brush assembly, grounded	29	2	..	1/2	.25
PS-1066	Housing, pinion, assembly	29	1	5	14	5.75
8X-120	Screw, 10-32x5/8 Fil-lister head.	29	3	..	1/10	.05
X-196	Washer, No. 10 lock. . .	29	3	..	1/50	.05
X-199	Washer, 1/4" lock. . . .	29	2	..	1/50	.05
X-261	Key, No. 6 Woodruff. . .	29	1	..	1/14	.05
X-532	Rivet, 1/8x1/4 oval head tubular.	29	4	..	1/50	.05
-1014	Washer, 5/16" lock . . .	29	2	..	1/20	.05
(-1376	Nut, hex., 5/16x24 . . .	29	1	..	1/5	.05

HEAD LAMP AND TAIL LAMP PARTS

06330 AB Head Lamp - Their Model No. 524M

03609 AB Tail Lamp - Their Model No. 225A

Purchased from Guide Lamp Company, Anderson, Ind.

Part No.	Description	Page No.	Qty. Used Per Lamp	Weight Each		Price Each
				Lbs.	Oz.	
103319	Lockwasher for mounting plate.	27	2	..	4/125	.05
115428	Bulb, 3 C.P. single contact, 6-8 Volt	27	1	..	8/25	.35
120367	Nut, mounting bolt . . .	27	2	..	4/25	.05
120377	Nut, mounting bolt . . .	27	1	..	6/25	.05
120382	Washer, mounting bolt. .	27	1	..	2/25	.05
122159	Screw, terminal.	27	2	..	6/125	.05
138530	Washer, shakeproof, for terminal screw	27	2	..	6/125	.05
145431	Bulb, 32 C.P., single contact, 6-8 volt. . .	27	1	..	17/25	.35
911500	Body, assembly	27	1	..	8-4/5	.75
911505	Lens, ruby	27	1	..	2-4/25	.20
911506	Glass, outlook	27	1	..	4	.20
911508	Gasket, outlook glass. .	27	1	..	11/125	.05
912048	Screw, moulding.	27	1	..	1/10	.05
912501	Plug assembly.	27	1	..	2/5	.15
913243	Ring, lens retaining spring	27	1	..	1/2	.10
914498	Washer, bearing, mounting plate.	27	1	..	17/25	.05
919924	Wiring assembly.	27	1	..	5/8	.20
921520	Moulding assembly. . . .	27	1	..	2-2/5	.50
922785	Spring, terminal post. .	27	1	..	1/20	.05
922786	Post, terminal	27	1	..	1/8	.20
5931876	Lens	27	1	..	11	.60
5931877	Gasket	27	1	..	2/3	.10
5931878	Body assembly.	27	1	..	13-3/5	1.50
5932042	Reflector with gasket. .	27	1	..	3-7/25	.75

GREASE GUN

07558 AB Grease Gun - Their Model No. 5950

Purchased from Lincoln Engineering Company, St. Louis, Mo.

Part No.	Description	Page No.	Qty. Used	Weight Each		Price Each
				Lbs.	Oz.	
10539	Body, nozzle	65	1	..	1/4	.20
10-733	Cap, linpak.	65	1	..	1/12	.25
11-541	Adapter.	65	1	..	1/10	.15
32-032	Gasket, container. . . .	65	1	..	1/50	.05
34-019	Packing, adapter	65	1	..	1/15	.10
34-034	Packing, plunger	65	1	..	1/15	.08
34-050	Washer, linpak	65	2	..	1/35	.10
41-121	Body, pump	65	1	..	9	.65
56-022	Spring, ball check . . .	65	1	..	1/25	.05
66-011	Ball, pump check	65	1	..	1/30	.02
67-018	Extension, nozzle. . . .	65	1	..	6	.15
81-094	Container assembly . . .	65	1	1	..	1.10
89-961	Plunger assembly	65	1	..	3	.30

AMERICAN STANDARD HEXAGON HEAD CAP SCREWS

Part No.	Description	Qty. Used	Weight Per 100 Pieces		Price Per 100 Pieces
			Lbs.	Oz.	
31AA-4	Screw, 5/16x1/2 hexagon head cap screw N. C. thread.	4	2	3	1.00
31AA-5	Screw, 5/16x5/8 hexagon head cap screw N. C. thread.	16	2	5	1.15
31AA-6	Screw, 5/16x3/4 hexagon head cap screw N. C. thread.	22	2	9	1.15
31AA-7	Screw, 5/16x7/8 hexagon head cap screw N. C. thread.	8	2	14	1.30
31AA-8	Screw, 5/16x1 hexagon head cap screw N. C. thread.	9	3	2	1.30
37AA-5	Screw, 3/8x5/8 hexagon head cap screw N. C. thread.	3	3	6	1.45
37AA-6	Screw, 3/8x3/4 hexagon head cap screw N. C. thread.	8	3	14	1.45
37AA-7	Screw, 3/8x7/8 hexagon head cap screw N. C. thread.	1	4	3	1.60
37AA-8	Screw, 3/8x1 hexagon head cap screw N. C. thread.	25	4	10	1.60
37AA-10	Screw, 3/8x1-1/4 hexagon head cap screw N. C. thread.	10	5	5	1.75
37AA-12	Screw, 3/8x1-1/2 hexagon head cap screw N. C. thread.	2	6	2	1.85
37AA-13	Screw, 3/8x1-5/8 hexagon head cap screw N. C. thread.	1	6	8	2.00
• 37AA-14	Screw, 3/8x1-3/4 hexagon head cap screw N. C. thread.	2	6	14	2.00
37AA-20	Screw, 3/8x2-1/2 hexagon head cap screw N. C. thread.	4	9	3	2.65
50AA-6	Screw, 1/2x3/4 hexagon head cap screw N. C. thread.	8	8	2	3.20
50AA-8	Screw, 1/2x1 hexagon head cap screw N. C. thread.	3	9	7	3.50
50AA-10	Screw, 1/2x1-1/4 hexagon head cap screw N. C. thread.	5	10	2	3.75
50AA-12	Screw, 1/2x1-1/2 hexagon head cap screw N. C. thread.	16	11	14	4.00
50AA-14	Screw, 1/2x1-3/4 hexagon head cap screw N. C. thread.	6	13	5	4.25
50AA-16	Screw, 1/2x2 hexagon head cap screw N. C. thread.	10	14	4	4.50
50AA-18	Screw, 1/2x2-1/4 hexagon head cap screw N. C. thread.	2	15	10	4.85
50AA-24	Screw, 1/2x3 hexagon head cap screw N. C. thread.	1	19	12	5.85
50AA-40	Screw, 1/2x5 hexagon head cap screw N. C. thread.	4	30	12	12.00
62AA-10	Screw, 5/8x1-1/4 hexagon head cap screw N. C. thread.	4	17	9	6.20
62AA-16	Screw, 5/8x2 hexagon head cap screw N. C. thread.	4	22	12	7.50
75AA-16	Screw, 3/4x2 hexagon head cap screw N. C. thread.	4	34	14	10.50
25AB-5	Screw, 1/4x5/8 hexagon head cap screw N. F. thread.	2	1	8	1.00
31AB-6	Screw, 5/16x3/4 hexagon head cap screw N. F. thread.	2	2	11	1.15
31AB-8	Screw, 5/16x1 hexagon head cap screw N. F. thread.	2	3	3	1.30
31AB-12	Screw, 5/16x1-1/2 hexagon head cap screw N. F. thread.	4	4	4	1.60
37AB-6	Screw, 3/8x3/4 hexagon head cap screw N. F. thread.	1	4	..	1.45

AMERICAN STANDARD HEXAGON HEAD CAP SCREWS (Continued)

Part No.	Description	Qty. Used	Weight Per 100 Pieces		Price Per 100 Pieces
			Lbs.	Oz.	
37AB-8	Screw, 3/8x1 hexagon head cap screw N. F. thread.	2	4	13	1.60
37AB-10	Screw, 3/8x1-1/4 hexagon head cap screw N. F. thread.	2	5	8	1.75
37AB-12	Screw, 3/8x1-1/2 hexagon head cap screw N. F. thread.	2	6	5	1.85
37AB-16	Screw, 3/8x2 hexagon head cap screw N. F. thread.	1	7	14	2.25
37AB-18	Screw, 3/8x2-1/4 hexagon head cap screw N. F. thread.	1	8	10	2.50
50AB-8	Screw, 1/2x1 hexagon head cap screw N. F. thread.	2	9	13	3.50
50AB-12	Screw, 1/2x1-1/2 hexagon head cap screw N. F. thread.	2	12	10	4.00
50AB-14	Screw, 1/2x1-3/4 hexagon head cap screw N. F. thread.	4	14	..	4.25
50AB-16	Screw, 1/2x2 hexagon head cap screw N. F. thread.	8	15	5	4.50
50AB-18	Screw, 1/2x2-1/4 hexagon head cap screw N. F. thread.	5	16	11	4.85
62AB-24	Screw, 5/8x3 hexagon head cap screw N. F. thread.	8	33	3	9.00

AMERICAN STANDARD FLAT HEAD CAP SCREW

50AC-8	Screw, 1/2x1 flat head cap screw N. C. thread.	4	9	6	3.50
--------	--------------------------------------------------------	---	---	---	------

AMERICAN STANDARD FILLISTER HEAD CAP SCREW

37AE-30	Screw, 3/8x3-3/4 fillister head cap screw N. C. thread.	2	13	..	5.80
---------	-----------------------------------------------------------------	---	----	----	------

AMERICAN STANDARD ROUND HEAD MACHINE SCREW

12AH-2	Screw, 1/8x1/4 round head machine screw N. C. thread.	1	1	9	.20
14AH-3	Screw, No. 6-32x3/8 round head machine screw N. C. thread. . .	4	2	6	.21
18AH-4	Screw, 3/16x1/2 round head machine screw N. C. thread.	2	4	14	.36
25AH-3	Screw, 1/4x3/8 round head machine screw N. C. thread.	1	8	50	.54
25AH-4	Screw, 1/4x1/2 round head machine screw N. C. Thread.	4	9	13	.60
25AH-6	Screw, 1/4x3/4 round head machine screw N. C. thread.	5	12	6	.68
25AH-12	Screw, 1/4x1-1/2 round head machine screw N. C. thread.	1	20	3	1.05
31AH-4	Screw, 5/16x1/2 round head machine screw N. C. thread.	4	17	10	1.07
31AH-5	Screw, 5/16x5/8 round head machine screw N. C. thread.	1	19	11	1.14
31AH-6	Screw, 5/16x3/4 round head machine screw N. C. thread.	3	21	13	1.16
31AH-12	Screw, 5/16x1-1/2 round head machine screw N. C. thread.	4	34	4	1.60
37AH-18	Screw, 3/8x2-1/4 round head machine screw N. C. thread.	2	71	3	3.00
18AJ-6	Screw, 3/16x3/4 round head machine screw N. F. thread.	6	6	6	.40

AMERICAN STANDARD FLAT HEAD MACHINE SCREW

Part No.	Description	Qty. Used	Weight Per 100 Pieces		Price Per 100 Pieces
			Lbs.	Oz.	
25AK-5	Screw, 1/4x5/8 flat head machine screw N. C. thread.	10	1	2	.65
31AK-5	Screw, 5/16x5/8 flat head machine screw N. C. thread.	6	2	..	1.14

AMERICAN STANDARD FILLISTER HEAD MACHINE SCREW

16AM-2	Screw, No. 8-32x1/4 fillister head machine screw N. C.	2	..	4	.25
16AM-4	Screw, No. 8-32x7/16 fillister head machine screw N. C.	1	..	5	.29
16AM-8	Screw, No. 8-32x1 fillister head machine screw N. C.	4	..	9	.38
19AM-2	Screw, No. 10-24x5/16 fillister head machine screw N. C.	2	..	6	.33
19AM-8	Screw, No. 10-24x1 fillister head machine screw N. C.	4	..	12	.46
19AM-11	Screw, No. 10-24x1-3/8 fillister head machine screw N. C.	2	1	..	.62
13AN-3	Screw, No. 6-40x3/8" fillister head machine screw N. F.	1	..	3	.21
25AN-3	Screw, 1/4x3/8 fillister head machine screw N. F.	4	..	14	.68

AMERICAN STANDARD CUP POINT SET SCREW

37AZ-6	Screw, 3/8x3/4 cup point set screw N. C. thread.	2	1	9	1.85
37AZ-8	Screw, 3/8x1 cup point set screw N. C. thread.	2	2	1	2.15
37AZ-12	Screw, 3/8x1-1/2 cup point set screw N. C. thread.	3	2	10	2.60
37AZ-14	Screw, 3/8x1-3/4 cup point set screw N. C. thread.	2	3	2	2.90

AMERICAN STANDARD SQUARE HEAD MACHINE BOLT

31BP-8	Bolt, 5/16x1 square head machine bolt N. C. thread.	1	5	..	1.20
31BP-10	Bolt, 5/16x1-1/4 square head machine bolt N. C. thread.	4	5	8	1.35
31BP-32	Bolt, 5/16x4 square head machine bolt N. C. thread.	1	11	..	2.15
37BP-8	Bolt, 3/8x1 square head machine bolt N. C. thread.	2	7	10	1.60
50BP-10	Bolt, 1/2x1-1/4 square head machine bolt N. C. thread.	8	17	..	3.40
50BP-16	Bolt, 1/2x2 square head machine bolt N. C. thread.	1	21	..	3.65
62BP-12	Bolt, 5/8x1-1/2 square head machine bolt N. C. thread.	4	34	..	6.05
75BP-44	Bolt, 3/4x5-1/2 square head machine bolt N. C. thread.	2	99	..	11.60

AMERICAN STANDARD HEXAGON HEAD MACHINE BOLT

31BR-6	Bolt, 5/16x3/4 hexagon head machine bolt N. C. thread.	4	4	8	1.20
37BR-8	Bolt, 3/8x1 hexagon head machine bolt N. C. thread.	6	7	10	1.60
50BR-16	Bolt, 1/2x2 hexagon head machine bolt N. C. thread.	4	20	8	3.65

AMERICAN STANDARD STOVE BOLT

Part No.	Description	Qty. Used	Weight Per 100 Pieces		Price Per 100 Pieces
			Lbs.	Oz.	
18CE-4	Bolt, 3/16x1/2 round head stove bolt.	2	..	8	.40
18CE-6	Bolt, 3/16x3/4 round head stove bolt.	1	..	10	.40
25CE-5	Bolt, 1/4x5/8 round head stove bolt.	9	1	4	.55
25CE-6	Bolt, 1/4x3/4 round head stove bolt.	2	1	8	.55

AMERICAN STANDARD CARRIAGE BOLT

37CK-8	Bolt, 3/8x1 round head carriage bolt.	2	7	2	1.40
--------	-----------------------------------------------	---	---	---	------

AMERICAN STANDARD HEXAGON NUT

14EA-0	Nut, No. 6-32 hexagon, regular, unfinished, N. C. thread.	4	..	3-1/2	.33
25EA-0	Nut, 1/4 hexagon, regular, unfinished N. C. thread.	2	..	12	.55
31EA-0	Nut, 5/16 hexagon, regular, unfinished, N. C. thread.	9	1	7	.75
37EA-0	Nut, 3/8 hexagon, regular, unfinished, N. C. thread.	2	2	3	1.05
50EA-0	Nut, 1/2 hexagon, regular, unfinished, N. C. thread.	1	4	14	2.00
62EA-0	Nut, 5/8 hexagon, regular, unfinished, N. C. thread.	4	8	14	2.65
25EC-0	Nut, 1/4 hexagon, regular, semi finish, N. C. thread.	2	..	12	.60
31EC-0	Nut, 5/16 hexagon, regular, semi finish, N. C. thread.	7	1	7	.85
37EC-0	Nut, 3/8 hexagon, regular, semi finish, N. C. thread.	11	2	3	1.10
50EC-0	Nut, 1/2 hexagon, regular, semi finish N. C. thread.	8	4	14	2.10
37ED-0	Nut, 3/8 hexagon, regular, semi finish N. F. thread.	2	2	3	1.10
43ED-0	Nut, 7/16 hexagon, regular, semi finish N. F. thread.	8	3	6	1.50
50ED-0	Nut, 1/2 hexagon, regular, semi finish N. F. thread.	18	4	14	2.10
62ED-0	Nut, 5/8 hexagon, regular, semi finish N. F. thread.	8	8	14	3.30
100ED-0	Nut, 1" hexagon, regular, semi finish, N. F. thread.	4	29	6	10.45
25EK-0	Nut, 1/4 hexagon, light, semi finish, N. F. thread.	3	..	11	.60
31EK-0	Nut, 5/16 hexagon, light, semi finish, N. F. thread.	7	1	1	.85
37EK-0	Nut, 3/8 hexagon, light, semi finish N. F. thread.	13	1	8	1.10
43EK-0	Nut, 7/16 hexagon, light, semi finish N. F. thread.	4	2	2	1.50
50EK-0	Nut, 1/2 hexagon, light, semi finish N. F. thread.	8	3	10	2.10
62EK-0	Nut, 5/8 hexagon, light, semi finish N. F. thread.	15	6	15	3.30
75EK-0	Nut, 3/4 hexagon, light, semi finish N. F. thread.	12	9	14	4.70
87EK-0	Nut, 7/8 hexagon, light, semi finish N. F. thread.	2	16	3	7.70

AMERICAN STANDARD HEXAGON NUT (Continued)

Part No.	Description	Qty. Used	Weight Per 100 Pieces		Price Per 100 Pieces
			Lbs.	Oz.	
37EN-0	Nut, 3/8 hexagon jam, regular, unfinished, N. C. thread.	5	1	8	1.05
50EN-0	Nut, 1/2 hexagon jam, regular, unfinished N. C. thread.	1	3	4	2.00
31EQ-0	Nut, 5/16 hexagon jam, regular semi finish N. C. thread.	1	1	2	.85
37EQ-0	Nut, 3/8 hexagon jam, regular semi finish N. C. thread.	6	1	8	1.10
50EQ-0	Nut, 1/2 hexagon jam, regular semi finish N. C. thread.	2	3	4	2.10
62EQ-0	Nut, 5/8 hexagon jam, regular semi finish N. C. thread.	1	6	2	3.30
31EX-0	Nut, 5/16 hexagon jam, light semi finish N. F. thread.	8	..	12	.85
37EX-0	Nut, 3/8 hexagon jam, light semi finish N. F. thread.	1	1	..	1.10
50EX-0	Nut, 1/2 hexagon jam, light semi finish N. F. thread.	7	2	9	2.10
75EX-0	Nut, 3/4 hexagon jam, light semi finish N. F. thread.	1	5	12	4.70
100EX-0	Nut, 1" hexagon jam, light semi finish N. F. thread.	5	14	2	10.45
112EX-0	Nut, 1-1/8 hexagon jam, light semi finish N. F. thread.	1	20	8	14.35
31FH-0	Nut, 5/16 hexagon castle, light semi finish N. F. thread.	1	1	2	1.35
62FH-0	Nut, 5/8 hexagon castle, light semi finish N. F. thread.	3	7	2	4.90
87FH-0	Nut, 7/8 hexagon castle, light semi finish N. F. thread.	2	17	2	10.75
13FK-0	Nut, No. 6 hexagon machine screw nut, semi finish N. F. thread .	1	..	3	.60
18FK-0	Nut, 3/16 hexagon machine screw nut, semi finish N. F. thread .	6	..	5-1/4	.60

AMERICAN STANDARD SQUARE NUT

31FQ-0	Nut, 5/16 square, regular unfinished N. C. thread.	5	1	9	.65
37FQ-0	Nut, 3/8 square, regular unfinished N. C. thread.	4	2	10	.95
18FU-0	Nut, 3/16 square, for stove bolt and machine screw, N. C. thread	3	..	6-1/2	.50
25FU-0	Nut, 1/4 square, for stove bolt and machine screw, N. C. thread	13	..	14	.50

WING NUTS

31FY-0	Nut, 5/16 wing.	2	2	3	3.05
--------	-------------------------	---	---	---	------

SAE STANDARD LOCK WASHERS

Part No.	Description	Qty. Used	Weight Per 100 Pieces		Price Per 100 Pieces
			Lbs.	Oz.	
15GA-0	Washer, No. 6 standard lock . . .	6	..	2/5	.11
17GA-0	Washer, No. 8 standard lock . . .	7	..	7/10	.11
18GA-0	Washer, 3/16 standard lock. . . .	5	..	1	.11
20GA-0	Washer, No. 10 standard lock. . .	17	..	1	.11
25GA-0	Washer, 1/4 standard lock	20	..	3	.14
31GA-0	Washer, 5/16 standard lock. . . .	69	..	5	.22
37GA-0	Washer, 3/8 standard lock	68	..	8	.30
43GA-0	Washer, 7/16 standard lock. . . .	4	1	1	.50
50GA-0	Washer, 1/2 standard lock	66	1	5	.70
62GA-0	Washer, 5/8 standard lock	22	2	6	1.20
75GA-0	Washer, 3/4 standard lock	14	4	5	2.20
87GA-0	Washer, 7/8 standard lock	2	5	2	2.55
100GA-0	Washer, 1 standard lock	4	9	1	4.95
112GA-0	Washer, 1-1/8 standard lock . . .	1	12	8	5.50
37GB-0	Washer, 3/8 standard lock, light.	1	..	6	.30

STANDARD SHAKEPROOF LOCK WASHERS

					Price Each
37GM-0	Washer, 3/8 standard shakeproof lock.	2	..	4	.02

U. S. STANDARD PLAIN WASHER

			Pieces Per Lb.	Price Per Lb.
25GR-0	Washer, 1/4 standard plain. . . .	1	362	.20
31GR-0	Washer, 5/16 standard plain . . .	6	149	.18
37GR-0	Washer, 3/8 standard plain. . . .	11	111	.14
50GR-0	Washer, 1/2 standard plain. . . .	2	41	.12

HOSE CLAMPS

			Weight Each	Price Each
11HC-0	Clamp, No. 11 for 1-7/8 O. dia. hose.	2	.. 1/2	.11

COTTER PIN

			Weight Per 100 Pieces		Price Per 100 Pieces
			Lbs.	Oz.	
06HP-3	Pin, 1/16x3/8 cotter.	2	..	3/4	.05
06HP-4	Pin, 1/16x1/2 cotter.	1	..	1	.05
06HP-5	Pin, 1/16x5/8 cotter.	1	..	1	.05
09HP-4	Pin, 3/32x1/2 cotter.	6	..	2-1/3	.05
09HP-5	Pin, 3/32x5/8 cotter.	3	..	2-5/8	.06
09HP-7	Pin, 3/32x7/8 cotter.	8	..	3	.07
12HP-8	Pin, 1/8x1 cotter	8	..	7	.09
12HP-10	Pin, 1/8x1-1/4 cotter	5	..	8	.11
12HP-12	Pin, 1/8x1-1/2 cotter	1	..	9-1/2	.13
12HP-16	Pin, 1/8x2 cotter	2	..	12	.16
18HP-10	Pin, 3/16x1-1/4 cotter.	2	..	19	.24
25HP-12	Pin, 1/4x1-1/2 cotter	1	2	8	.46
25HP-20	Pin, 1/4x2-1/2 cotter	2	3	10	.70

GROOVE PIN

Part No.	Description	Qty. Used	Weight Each		Price Each
			Lbs.	Oz.	
09JG-3	Pin, 3/32x3/8 full length taper groove, Type 1	1	..	1/10	.01
09JG-5	Pin, 3/32x5/8 full length taper groove, Type 1	1	..	1/9	.01
15JG-12	Pin, 5/32x1-1/2 full length taper groove, Type 1	1	..	1/7	.04
37JH-20	Pin, 3/8x2-1/2 half length taper groove, Type 2	1	..	1	.10
31JL-8	Pin, 5/16x1 center groove, Type 5	1	..	1/3	.05

STREET ELBOW

12KA-0	Elbow, 1/8 street	1	..	1/2	.08
--------	-----------------------------	---	----	-----	-----

PIPE CAP

25KK-0	Cap, 1/4 pipe, hexagon head . . .	1	..	1	.04
--------	-----------------------------------	---	----	---	-----

PIPE PLUG

12KT-0	Plug, 1/8 pipe, square head . . .	3	..	1/4	.04
25KT-0	Plug, 1/4 pipe, square head . . .	2	..	1/2	.04
37KT-0	Plug, 3/8 pipe, square head . . .	2	..	3/4	.05
50KT-0	Plug 1/2 pipe, square head . . .	3	..	1	.04
125KT-0	Plug, 1-1/4 pipe, square head . .	1	..	5	.08
150KT-0	Plug, 1-1/2 pipe, square head . .	1	..	7	.11

WELCH PLUG

100LC-0	Plug, 1" Welch	2	..	1/4	.11
162LC-0	Plug, 1-5/8" Welch	1	..	3/4	.11

DOLE COMPRESSION COUPLINGS

12LR-3	Connector, 1/8x3/16 Dole compression couplings A3 male . . .	1	..	1/3	.06
12LU-3	Elbow, 1/8x3/16 Dole compression coupling, A7 male	5	..	1/2	.17
0-LX3	Union, 1/8 Dole compression coupling, A10 tee union	1	..	1	.17
12MA-3	Connector, 1/8x3/16 Dole compression coupling, A13 female .	1	..	1	.17

AMERICAN STANDARD CUP POINT HEADLESS SET SCREW

25MV-2-1/2	Screw, 1/4x5/16 headless set screw, cup point, slotted . . .	1	..	6	.02
------------	--------------------------------------------------------------	---	----	---	-----

RIVETS

Part No.	Description	Qty. Used	Weight Per 100 Pieces		Price Per Lb.
			Lbs.	Oz.	
25PA-12	Rivet, 1/4x3/4 round head rivet .	1	1	9	.19
37PA-56	Rivet, 3/8x3-1/2 round head rivet	1	12	6	.19
50PA-36	Rivet, 1/2x2-1/4 round head rivet	3	16	6	.19
09PB-4	Rivet, 3/32x1/4 flat head rivet .	2	..	3/4	.19
25PC-8	Rivet, 1/4x1/2 wagon box head rivet	4	1	2	.19
					Price Per 100
14PK-5	Rivet, 9/64x5/16 brass tubular countersunk No. 2561.	18	..	3-1/2	.35
14PK-10	Rivet, 9/64x10/16 brass tubular countersunk No. 2561.	4	..	6	.50
					Price Per Lb.
18PL-10	Rivet, 3/16x5/8 copper belt head.	56	1	..	.70

LUBRICATING FITTING

			Weight Each		Price Each
			Lbs.	Oz.	
12QA-0	Fitting, 1/8 straight lubricating; purchased from Lincoln Engineering Co., St. Louis, Mo. Their No. 5000.	18	..	1/4	.06
12QD-0	Fitting, 1/8-45° lubricating; purchased from Lincoln Engineering Co., St. Louis, Mo. Their No. 5200.	1	..	1/4	.12

WOODRUFF KEY

AWK-0	Key, No. A Woodruff	4	..	1/6	.02
CWK-0	Key, No. C Woodruff	1	..	1/2	.04
6WK-0	Key, No. 6 Woodruff	4	..	1/14	.01
9WK-0	Key, No. 9 Woodruff	1	..	1/8	.01
15WK-0	Key, No. 15 Woodruff.	8	..	1/3	.03
29WK-0	Key, No. 29 Woodruff.	2	..	1	.08
207WK-0	Key, No. 207 Woodruff	2	..	1/16	.01
404WK-0	Key, No. 404 Woodruff	1	..	1/14	.01

